Home Computing WEEKLY

An Argus Specialist Publication

No.40
Dec 6-12, 1983

38p

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Barry goes electronic for radio show

Film buff Barry Norman has gone electronic for his new job as presenter of a radio magazine on computers.

Documents like scripts and interview notes are now sent to his home in Hertfordshire via Telecom Gold, British Telecom's electronic mail service.

He has a newly-installed Apricot micro to communicate with a Sirius in the London offices of The Chip Show.

Radio Four begins broadcasting the weekly series on Saturday January 14 at 5pm with repeats on VHF the following Tuesdays at 11pm.

Producer Trevor Taylor said: "Barry is tickled pink with his computer.

"He got used to it in about an

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Is your micro safe?

Home computers are becoming more popular among burglars, warn police and insurance companies.

"They are being stolen left, right and centre — just like video recorders," said a senior official at the Prudential.

Police advise computer owners to mark their micros, and other moveable equipment, with special pens using ink which shows only under ultra-violet light. Post code and house

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£1,000 competition win great two-in-one games from PHOENIX

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GSH

24 PAGES OF SPECTRUM BEST

Send 50p stamp to: Software Supermarket, 87 Howard's Lane, London SW15 6NU

Three new games for the Colour Genie are out from the Ipswich Software Factory. Costing £8 each, they are A-10 Bomber, Geniepede and Martian Rescue.

Ipswich Software Factory, Ipswich, Suffolk

PSS has five new releases for the Commodore 64. They are all adventure games, and all five have been imported from North America, where the 64 has been around for quite a while. Entitled Metro Blitz, Cosmic Split, Moby Dick, Krystals of Zong and Neoclyps, they cost £7.95 each.

PSS, 452 Stoney Stanton Road, Coventry CV6 5DG

First offering from new software company Mushroomsoft is Bigtime, in which as a struggling musician you try to take your band to the top. It's for the 48K Spectrum, and costs £4.50.

Mushroomsoft, 13 Harnorlen Road, Peverell, Plymouth PL2 3NU

Richard Shepherd's best-selling adventure game Transylvanian Tower is now available for the Dragon. Price: £6.50.

Richard Shepherd, Elm House, 23-25 Elmshott Lane, Cippenham, Slough, Berks.

New from Micromega for the Spectrum: Deathchase, a 3D motorcycle chase, and Starclash, a multi-screen arcade game. They cost £6.95 each.

Micromega, 230-236 Lavender Hill, London SW11 1LE

Arcade games are going back to their roots. Bubble Bus has just announced Kick-Off, a simulation of table football — you remember, that game you used to play in amusement arcades when Space Invaders was still a twinkle in Atari's eye. But the computer version has music. Back to the 1980s, the other new launch from Bubble Bus is Widows Revenge — like their Exterminator, but this time the spiders fire back. Both for the Commodore 64, both priced at £6.99.

Bubble Bus, The Computer Room, 87 High Street, Tonbridge, Kent TN1 1LS

Home Computing WEEKLY

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Ring Coleen or Barry on 01-437 1002 NOW!

There's seven pages of software reviews in this issue . . . more than any other magazine

Type in the two VIC-20 programs (pages 13 and 60) or the three 1K ZX81 programs (page 16) in this bumper issue of Home Computing Weekly

PHOENIX

We've got 40 prizes of great two-in-one games from Phoenix Software to give away. Turn to page 73 and send us your entry today

EARLY WARNING: We're moving. We move into our new offices on December 20. The address: No. 1 Golden Square, London W1R 3AB. Our phone number will then be: 01-437 0626.

AGF

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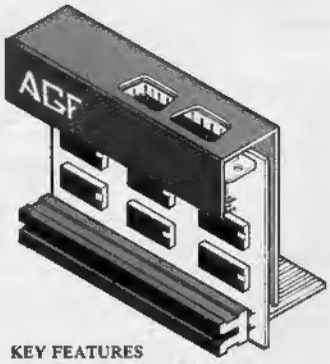
When a suitable joystick is plugged into 'Player 1' socket its action will mimic pressing the cursor keys, up "7", left "5" and so on. The firing button will simulate key 0. This unique feature guarantees the best software support.

Take a look at the selection of compatible games we have listed. More are being added all the time as a result of our contact with the various software companies.

A second Joystick may be connected in the 'Player 2' position which simulates in a parallel fashion keys T-Y-U-I-P. This will allow you to play a whole new generation of two player games.



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* Proven cursor key simulation for maximum software support
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* Second Joystick facility
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3D Tanx	: DK 'Tronics	£4.95
Splat !	: Incentive Software Ltd	£5.50
Pheenix	: Megadodo Software	£5.50
Escape	: New Generation Software	£4.95
3D Tunnel	: " "	£5.95
Knot in 3D	: " "	£5.95
Cyber Rats	: Silversoft	£5.95

COMPATIBILITY CASSETTES £4.95

These cassettes have short programs to load before the chosen game which will convert it to use the cursor keys and therefore become compatible with the Interface Module II.

Cassette 1 converts	Cassette 2 converts
Arcadia	Centipede
Schizoids	Planetoids
Hungry Horace	Jet-Pac
Horace Goes Skiing	† Pssst
Spectres	† 3D Combat Zone
Penetrator	† Invaders

† *Will require 48K Memory.*

FROM: MR/MRS/MISS

ADDRESS

HCW 40

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	SOFTWARE:		
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Buffer Micro Ltd
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Chelsea Micros Ltd
14 Jerdan Place, London SW6 1BH
Computers of Wigmore Street
87 Wigmore Street, London W1H 9FA
Everybodys Hobbies
1 Great Colman Street, Ipswich, Suffolk IP4 2AA
4Mat Computing
67 Friargate, Preston, Lancashire PR1 2AT
Gamer
24 Gloucester Road, Brighton BN1 4AQ
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Melgray Hi-Tech Ltd
49 Broad Street, Hereford HR4 9AR
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296 Gloucester Road, Horfield, Bristol
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74 Green Lane, Tettenhall, Wolverhampton
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144 St George's Road, Cheltenham Gloucestershire GL50 3EL
Screens
6 Main Avenue, Moor Park, Northwood Middlesex.
Syntax Computers
76 Cornwall Street, Plymouth PL1 1NS
Teleco Video
53 Maple Road, Penge, London SE20
Telford Electronics & Computing
26a Bradford Street, Shipnal, Shropshire TF11 8AU
The Computer Shop
Unit 2S, Handyside Arcade, Percy Street, Newcastle-upon-Tyne NE1 4PZ
The Computer Centre (Humberside) Ltd
26 Anlaby Road, Hull HU1 2PA

Barry's show

From front page

hour and within two hours we couldn't prise him off it. I'm not aware of any other broadcasters doing this."

Mr Taylor explained that Barry Norman was out and about on the first three days of every week, busy on his BBC TV series, Film 83/84.

Now when he returns he collects his messages and can reply straight away ready for when the office reopens.

The show will also prepare software for broadcasting after Radio Four's official closedown.

This method has often been used by other radio stations. Listeners will be asked to record the data signals on cassette recorders for loading into their home computers.

The programs will also be available on Ceefax.

Mr Taylor said the idea for the series — and regular software broadcasts — arose from Tomorrow's World, on which he worked.

He said: "After the experiment on Tomorrow's World people said: 'Can we have some useful programs.' We know there is an enormous demand."

It could even lead, he said, to listeners dialling up a micro at the BBC for interactive computing.

Each repeat of The Chip Show will be five minutes longer, at 35 minutes, than the original, so late news can be included — the first repeat will cover the Which Computer? Show in Birmingham.

But why choose Barry Norman, not a computer expert, for the show?

Mr Taylor said: "Barry is an excellent presenter and very interested in technology. He would not pretend to be an expert. But if people who are normally not interested in computers hear his name mentioned they are more likely to stay tuned.

"As well as the computer hobbyist, my audience is also going to be a number of people who happen to switch on the radio. I'm going to be trying to persuade them that they should be taking an interest.

"We are approaching it in a different way. We are not really going to be delving into the nuts and bolts. We will be looking at what computers can do and the effect they are having."

And Barry Norman said: "There is a need for a programme which talks about the computer revolution in terms everyone can understand. My baptism has already taken place."

Barry Norman — software and scripts

Best sellers: software houses act

Britain's biggest software companies are to be asked to help finance a Top 30 software chart of best sellers.

It would cost around £50,000 a time to collect the data from 250 retailers throughout the UK.

The figure was given by Gallup to Rod Cousens, managing director of Quicksilva and vice-chairman of the 15-member Guild of Software Houses. After talking to other market research companies, he is to present the proposition to the guild.

He said: "I believe the present system of charts is unrealistic and not a true reflection of the marketplace. It would also help us by giving information on sales trends in various parts of the country."

Mr Cousens said he hoped computer makers, distributors, magazines and retailers, as well as software houses, would help pay for the chart.

Because any software chart would be dominated by programs for the top-selling Spectrum, he thought that eventually charts for individual computer makes could be produced.

● GOSH is planning an approved list of dealers and is establishing a legal fund to fight overseas software piracy. Mr Cousens said he had heard of 180 dealers selling UK-made software in Portugal — and none was legitimate.

Guild of Software Houses, 79 Park Lane, Tottenham, London N17 0HG

Pint-sized printer

Lokata's new Cosmoprint thermal printer costs £99 and, measuring 200mm by 170mm by 85mm, is not much bigger than a ZX81.

It uses 112mm wide thermal paper and will print either 20, 40 or 60 columns or dot addressable graphics. Standard ASCII and RS232 interfaces mean that it will work with most micros.

Cosmoprint will be available from early 1984, initially by post from Lokata.

Lokata, Falmouth, Cornwall TR10 8AE

The compact Cosmoprint — cutting the cost of printing

Briefly

Santa Claus and carol singers will be among the visitors at the last big computer show before Christmas. The Your Computer Christmas Fair is at Wembley Conference Centre on December 15-18.

Reed Exhibitions, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ

Forty Co-op stores in the Manchester area are starting to stock home computers and 220-350 software titles each, depending on store size. The Norwest Pioneer Co-operative Society is stocking the Spectrum, VIC-20, Commodore 64, Atari 600XL and ZX81.

The first Acorn Education Exhibition is to be held on January 25-27 at the Central Hall, Westminster, and will be open to representatives of educational institutions and bodies.

Computer Marketplace (Exhibitions), 20 Orange Street, London WC2H 7ED

You could be on our pages

We welcome programs articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (use a new ribbon) and/or sent on cassette. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can aid other computer users.

Competitive rates are paid.

Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE

Micro thefts

From front page

number should be given.

It would at least mean that recovered property could be returned.

This was on top of the usual precautions on home security.

Royal Insurance has a special Mini-Micro policy — at first designed for businesses — but several insurance companies said new computer owners should check their home contents policies.

General Accident reckons £300m will have been spent on home computers in Britain by the end of the year — £195m more than in 1982. And the Christmas period alone would account for about £140m in sales.

Many home contents policies are index linked and cover replacement on a "new for old" basis.

But new goods, like computers, should be taken into account. If a claim was made and the company found the policyholder had undervalued his goods a reduced amount could be paid out.

One insurance expert said: "When you are working out the value of the things in your home always add a bit for luck."

Home contents insurance works out at roughly £3.50 for every £1,000-worth of property insured outside large cities. But this figure soars in areas like Kensington and Chelsea which have a greater rate of break-ins.

So far southern England has been the main area for computer thefts with very few reported in the north of England and Scotland.

However, the man from the GA said: "We expect that the rate of home computer thefts will follow the same pattern as that of video thefts, which are now at the top of every burglar's hit list."

A touch easier to use

Star Microterminals has brought out a special keyboard which makes it easier for young or handicapped children to use microcomputers.

The Concept is a flat pressure-sensitive keyboard with an eight by 16 matrix of touch-sensitive areas.

It is designed to take interchangeable paper overlays which define the number of "keys" on the keyboard and their functions, so the child only has to concentrate on the keys that are needed to operate a particular program.

For example, there could be just two keys for yes and no, or four arrow keys, or the keyboard could even be laid out in the form of a map.

Each touch-sensitive area has a seven-bit code so that the programmer can define the keys' function and size.

The Concept comes with interfaces for most popular micros, including the BBC B and Spectrum, and is available in A4 and A3 sizes.

For the BBC B, the A4 size would cost £104.65 inclusive, and the A3 size about £40 more.

Star Microterminals, 22 Hyde Street, Winchester, Hants. SO23 7DR

The Concept keyboard — an easier way for children to use micros

Briefly

The Commodore 64 range from Computer Software Associates of the USA is now available here from Marketing Micro Software. The range includes arcade, adventure and educational games, and prices start at £9.95. There's also Sprintyper, a typing tutor for the VIC-20, for £9.95.

Marketing Micro Software, Goddard Road, Whitehouse Industrial Estate, Ipswich, Suffolk IP1 5NP

Looking for programs for a new Atari 600XL? Phoenix Publishing is bringing out a book of 35 program listings, reasonably named The Atari 600XL Program Book. The 160 pages will cover games, utilities and adventures, and cost £5.95. It'll be out in time for Christmas.

Phoenix Publishing, 14 Vernon Road, Bushey, Herts WD2 2JL

Visions is following up its first three games with no less than nine more: Rapedes, Star Warrior, 1994, Arcturus and Sci File (Spectrum); Banana Drama and Gusher (Commodore 64); and Dare Devil Dennis and Pengi (BBC). Prices range from £5.95 to £24.95. Due out next year are Sound Studio and Paint Box for the BBC, which will cost £14.95 each.

Visions, 1 Felgate Mews, Studland Street, London W6 9JT

Can small shops fight the giants?

This year has seen tremendous shake ups in the computer business, from manufacture through to retail. Every stage has seen a harsh summer battle to stay in competition with the big guys, but there are harder times ahead as the battle for Christmas sales draws to its ultimate climax.

We have seen Dragon run out of fire, Texas Instruments play a wrong note with the 99/4A, Grundy die a death after a New Brain transplant, and Adam Osborne take a bite from the Apple — and consequently banished from the computer Eden.

Even companies which looked to be doing so well, such as Atari and Oric lost a large amount of money this year and Oric came within a hair's-breadth of closing down production.

Before I came into the business I could only view it from a hobbyist's point of view; I never realised the problems that were faced by the dedicated, specialist retailers when contending with giants such as Smiths, Boots, Rumbelows and Comet.

These outlets are too small to just ring Sinclair or Acorn and place orders for hundreds of units at a time. They have to get supplies through distributors (who also want their cut), and this is why they find it very difficult to compete, pricewise, with their giant counterparts.

But they can offer a service unequalled by any large superstore — the dedicated care and attention to provide customers with exactly what they may require and not to fob them off with any old system.

Many of them can help to solve programming problems and answer technical questions, as well as giving efficient repair services, many on site. Have you ever tried to get an answer from a salesman in one of the High Street chains?

Now so many of the small outlets are under threat, especially in large shopping centres, from those who just seek to take the public's money, wave them out of the door, and pray they don't return with problem or query.

And manufacturers blinded by large profits do not see or predict the return rate on faulty equipment because the superstores cannot repair them.

Nor do they envisage the complaints from customers who have found that the machine sold to them is totally unsatisfactory to their needs, especially since a vast percentage of customers have little or no knowledge of computers in this field.

When will manufacturers realise they are squeezing the life out of the industry by supplying to these 'cowboy' computer retailers who have little training in the field?

Very soon people are going to start asking the question, "Well, now that I've got it what can I do with it?" and only the dedicated, specialised outlets will be able to answer it. But they won't be around to do anything, because the bread and butter of these outlets will have been snatched away by the giants.

At last, the public are beginning to see the truth behind all the flashy bunkum and cheap cheap prices, but they may be enlightened too late to prevent the inevitable unless something happens soon.

By the manager of a small computer outlet

● This space is for you to sound off about the micro scene, to present bouquets or to hurl brickbats. Share your views by sending them to Paul Liptrot, Opinion, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Please indicate your occupation and your interest in computing. Ensure that your article is about the same length as this one.

We've got the Aquarius taped!

Now for the first time you can buy cassette based software for your Aquarius. All the excitement of arcade type action at the low, low price of £5.95.

'N' Vaders

The classic arcade golden oldie but written in machine code for fast, exciting action. Pit your wits and skills against squadrons of coloured weirdos. Blast them all from the sky – but beware, they get faster and meaner.

Ed'on

Eat the dots and avoid the planes to win through. An updated version of the addictive arcade game. Accelerate, decelerate, dodge and change lanes. If you manage to avoid destruction you go on to higher things.

JUST RELEASED

Phrogger

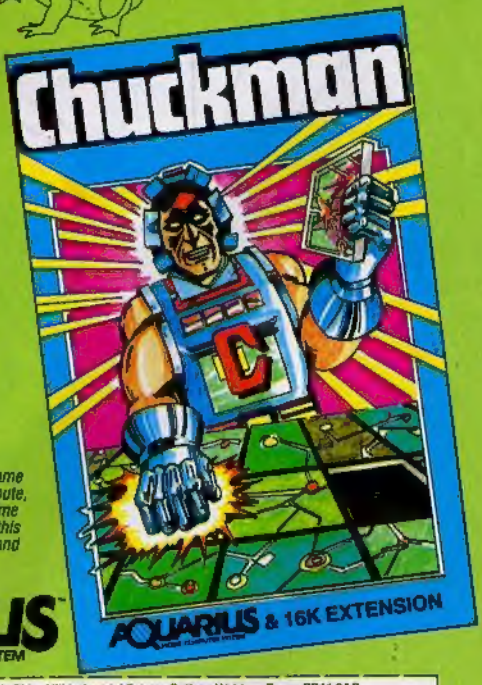
A leap in front of all other versions – an arcade quality game with truly amazing graphics. Hop, skip and jump across all the dangers and perils. Take your life in your controls to reach safety.

Aliens

You are one of the chosen 'Gatherers' selected by your unique abilities and talents. Probe the mysteries of the 'past times' building. Gather the secrets of the Universe. Have you the mental strength to survive and the character to win?

Chuckman

Based on the ever-popular arcade game with extra extras. Find the quickest route, avoid the meanies and defuse the time bombs to win the day. But beware, this game is addictive, you'll risk sleep and peace of mind.



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The Hobbit. Now the best is

"After a very short time I found that 'The Hobbit' was becoming almost a way of life rather than a game, and so when I finished it for the first time I was partly sad because I felt that all the fun and adventure had ended, but I was wrong. Even now I am discovering new things about the game and feel that it will be some time until all of its secrets are revealed to me."

MR. J. STERN, Herts

"I have at last received your 'Hobbit' program and would like to congratulate you on its excellence. After four days of sweat and tears I have completed only 37.5 per cent of the adventure. The program has lived up completely to expectations, and there is no doubt about it being the best production for the Spectrum to date. You have surpassed all others with your program."

"A lot of fun."

COMPUTI

"The excellent gra
The exciting differ
is that it is possibl
converse with all t
meet and ask their
recommend this g
Tolkien, or novel a

POPULAR COMP

"I am writing to co
'Hobbit'. I think it is one of
ingenious programs I have h
to use. It has kept me stum
months. I think the effort th
writing a program like this must have be
enormous. The effects are brilliant to say t
least."

JEREMY CHESTER

"Th bit takes first place in the new
quality and value for money."

SINCLAIR USER

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for the

COMPUTER

isty Mountains
this game is
eat to play and is No. 1 for
nd excitement."

GORDON DEMPTSTER, Scotland

"Thanks again for an excellent game in 'The Hobbit'. I feel I have really got my money's worth out of playing time. Congratulations!"

MR. P. RUSHTON, Leeds

"The most powerful computer game yet invented."

COMPUTER WEEKLY

"Within my circle of friends this game has become something of an obsession. We meet every Friday night at someone's house and spend 3-4 hours on 'The Hobbit'. Friday night would not be the same without 'The Hobbit'."

CHRISTINE VERCHILD, Wilts

"One new Adventure game stands head and shoulders above the rest. It alone almost provides you with a good enough reason to buy a 48K Sinclair Spectrum. Not only does The Hobbit produce drawings of the main scenes, but it also understands proper sentences rather than pairs of words for its commands. It comes with a copy of J.R.R. Tolkien's classic book of the same name. It is the program with the most detailed and best written documentation ever."

WHAT MICRO

"This is an impressively packaged Adventure game which makes good use of the Spectrum's colour graphics. They have not only produced one of the best games for the Spectrum, but given everyone else a lesson in good game design."

PRACTICAL COM

"I am the owner of a copy of 'The Hobbit' which is wonderful entertainment, and very challenging. I have other tapes and publications of yours, all of which are excellent."

MR. D.J. BURGH, Kent

"Having received the most excellent piece of programming I have ever seen, we have had no social life whatsoever. 'The Hobbit' has been dominating our lives since January and many nights have been spent until 3 o'clock trying to conquer it."

SIMON ROGERS, Avon

"I have recently purchased your excellent adventure game 'The Hobbit'. This greatly enhanced by the use of graphics, its availability in ality of having

Melbourne House

available for:

SPECTRUM
COMMODORE 64
ORIC 1
BBC

"In my software library, your program 'The Hobbit' takes first place."
DAVID MAXWELL, London

"I am the proud owner of your excellent program 'The Hobbit' and have alr... many happy, restful, relaxing... hours trying to solve its ..."

...tulate you on a ... I have enjoyed ...versely. I must thank you ...educing such a clever product. It ...as worth every penny of the purchase price."
MRS. J. RYCRAFT, Northampton

...d for my ZX ... you supply called ...n excellent ... the money. I find ...ery realistic. The ...accurate. It sticks ...e book, which is a ... it very compelling ...
...VEN CASSIDY, Essex

...ing recently purchased a Sinclair Sp...trum I decided to buy 'The Hobbit' sinc... I have been doing a literature project based on 'The Hobbit' with my class of 10 and 11 year old children. Over the last 10 weeks the children, having read the book, have been attempting the program with my assistance. Let me congratulate you on a most entertaining program."
MR. K. REID AND CLASS 7, Nottingham

"... more of an experience than a program!"
POPULAR COMPUTING WEEKLY

"... the most unique factor of this program is that the user instructs the computer in completely ordinary English sentences. The Hobbit program is capable of very sophisticated communications ..."
ZX COMPUTING

"I purchased 'The Hobbit' not long ago and since then I have been engrossed in the game, and I'm beginning to think no-one wants to talk to me as all I talk about is my adventures in, 'The Hobbit'..."
DAVID ROWLEY, Stoke-on-Trent

"The use of graphics is one of the features which makes The Hobbit special. The addition of graphics as good as these adds a whole new dimension to the Adventure. It is certainly a marvellous game, which should set the standard for future Spectrum adventures."
ZX COMPUTING

"'The Hobbit' is a beautifully constructed, frantically-maddening, tortuous, gloriously inconsistent, thoroughly spooky adventure – far better than I could have hoped for and certainly the finest of the dozen or so adventure programs I have. In short, I congratulate the four who sweated for a year and a half to concoct such a super result."
MR. PETER JONES, South Glam

"Nothing is certain in this Adventure, but uncertainty! Add to this the brilliant graphics that are used to describe many of the locations and we have an Adventure that is going to become a classic for the Spectrum."
POPULAR COMPUTING WEEKLY

"I am writing to congratulate you on your excellent program 'The Hobbit' for the Spectrum. I wake up in the middle of the night with an idea and have to load the adventure to try it out."
MR. PHILLIP DARLING, Suffolk

"A most impressive package."
DAILY EXPRESS

"...we are not eating food...we are losing sleep...and it's great! I reckon you can guess why. We are lost, completely and utterly lost, in the Hobbit program."
MR. JOHN HARRIS, Kuwait

"...one of the most complex games for the Sinclair machines I have seen..."
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All versions of "The Hobbit" are identical with regard to the adventure program. Due to memory limitations, BBC cassette version does not include graphics.

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HCW 1/12

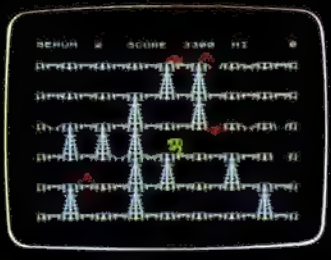
Problem. *Simulating an aircraft on a small microcomputer and depicting the 3-D world outside through the eyes of the pilot.*

Problem. *Turning the Spectrum's numerical abilities into powerful verbal skills combined with a huge vocabulary.*

PSION HAVE BIG PROBLEMS.

Problem. *Evaluating complex algorithms to provide sufficient depth of analysis in a short time.*

Problem. *Integrating cartoon-quality graphics with the realism of the ski-slope.*



Problem. *Creating cartoon-quality graphics in an entertaining and varied game.*

Problem. *Providing complex, sophisticated data handling through easy-to-use commands.*

Problem. *Modelling in 3-D on a small micro – performing some 7.5 million calculations for one hidden line drawing.*

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- Horace and The Spiders
- Horace Goes Skiing
- Backgammon
- Computer SCRABBLE® (48K)

'Horace' series produced in conjunction with Melbourne House
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Whichever program you choose, you can be sure it's high-quality, and action-packed.

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That means there's one good way to choose the best Spectrum software . . .

Just look for the Psion symbol on the cover of the cassette.

PSION

Make micros a minority interest!

In a previous column, I expressed a few thoughts about the rising division in computer instruction between children going to rich schools and those attending poor schools. Apparently someone cares about this situation

Xerox Corp. has recently donated 1000 computers worth about $5 million to the National Urban League to furnish more inner-city schools with computers. The computers have been specifically targeted at schools with large enrolments of minority students

The computers will be used in vocational training as well as in academic endeavours. They are Xerox Model 820-IIs, so this is not just some cheap shot by Xerox to unload a bunch of junk in the name of humanitarianism

It is no accident that Xerox made this move. Their president and chief executive officer is the League's new chairman. He has stated that computers should be used to help the kids to do their jobs better, not necessarily to have the computers become their jobs.

In other words, poor kids need help with learning programming, advanced math skills, and other subjects, just like rich kids, and not just be taught how to use a word processing program so that they can get jobs as secretaries. Right on, Xerox. Let's hope other manufacturers follow suit. Soon

★ ★ ★ ★

This item is also education related. Recently several computer-oriented learning centers have opened in various parts of the country. Their clientele are pre-schoolers and the subjects being taught are basic skills.

Kindercare Learning Centers have opened in Minneapolis Minnesota, Montgomery Alabama, and Houston Texas. The microstudents get instructions given to them by voice, a real voice recorded on a cassette and played back under computer control. The kids use a light pen to answer questions.

The subject matter is fairly varied, including premath and pre-reading concepts, memory skills, colors and shapes, and spatial concepts like "over" and "under"

Not to be outdone, there is of course Small World Nursery School in Silicon Valley. Microstudents there can learn about letters of the alphabet, shapes, and of course be able to play computer games.

Of course, like so much else, child psychologists are divided on the issue. Most agree that in small doses computers are helpful without causing any harm, although many warn that too much computing can be a bad thing for very young children.

There is probably some validity to the notion that the younger a person is introduced to computers the easier time they will have adjusting, but no one seems to be really sure how much is enough and how early is too early.

For those parents unable or unwilling to put brother and/or sister in computer kindergarten but still want them to learn about the subject, they can always buy the book called The New ABCs for the High Tech Baby, a text from Silver Lining Productions of Carmel Valley

The book combines the traditional ABC book with beautiful watercolor pictures of various aspects of the microworld. A is still for Apple, but B is for BASIC.

Is nothing sacred? How about D for Daisywheel or O for Output Screen? For those who feel threatened by all this, the authors have included a glossary filled with definitions. The book sells for about £10, if you need to buy a novel gift for friends of yours who just had a baby

It's never too soon to be computer literate. Send your inquiries and/or money to Silver Lining Productions, P.O. Box 221976, Carmel Valley CA 93922.

But I just don't know if I have the heart to take Rachel's Ladybird ABC book away and substitute D for Daisywheel, even if the wheel does look like a wheel of daisies.

Non-English BASIC spoken here. A firm called Multitech Industrial Corporation, headquartered in Hsinchu, Taiwan, has just announced that it can provide ROM cartridges for computers with BASIC in languages other than English

The company presently sells Chinese, Spanish, German and Japanese versions ranging in cost from about $20 to $30. Additionally, it will make custom software ROM cartridges for its own computer that will allow users to program in BASIC no matter what their language. (I wonder what a Swahili ROM would cost.) Multitech will provide such cartridges within two months after the order is placed.

In addition its own micro with English BASIC, the firm (which does have U.S. offices, one of which is in Sunnyvale, California) also makes a Chinese version of same. This is no mean feat as a special Chinese character controller had to be developed along with an expansion (64K) to the micro's normal capacity of 2K, allowing access of up to 22,000 Chinese characters. The computers are now being used in Taiwan schools so that children in the lower grades can learn to program in Chinese.

The firm's opinion is that since Chinese is one of the most difficult languages to learn and use, let alone implement in a computer, it will have no problem translating BASIC into any language, even those based on Roman characters, Oriental characters, and presumably even Cyrillic characters. If it catches on, the efforts of this company will make life in the programming world lots easier for many people (most of the world) who do not speak English as a native language

★ ★ ★ ★

Recently I mentioned the availability of the new Transtar letter quality printer for under $600. Not to rest on its laurels, Transtar has now announced a low cost colour printer with the same list price of $599!

The Transtar 315 uses a four hammer impact head to allow the printing of up to seven colours in over 30 shades in a single pass. The printer uses a unique four colour ribbon. The firm also makes an optional "PICS" card which allows a high or low resolution screen dump at the press of a button.

Right now, the unit is available and will work with the Apple and Franklin machines, but seeing as it is made by the same parent group that brought us the Epson, I suspect it will not be long before it is compatible with lots of other micros. Definitely looks like a good buy. Transtar is located at P.O. Box C-96975, Bellevue, Washington 98009.

★ ★ ★ ★

One of the most famous organizations dealing with computer educational application programs is the Minnesota Educational Computing Consortium (MECC)

Up till recently, a majority of their programs would only run on Apples and Ataris. At the present time, they are working on converting about 100 of these programs to run on the Commodore 64

The programs being converted fall into the following subject headings: music, biology, social science, earth science, nutrition, maths, languages, English, and of course computer literacy. Both Commodore and MECC plan to market these programs through their existing distribution networks

One of these outlets is K-12 MicroMedia. They will be glad to send you a copy of their catalog if you write to them: K-12 MicroMedia, P.O. Box 17, Valley Cottage, New York 10989, (201) 391-7555

This firm handles other products besides those marketed by the MECC. Each is described in good detail, and few are all that expensive. The programs run on the Apple, Atari, TRS-80, and PET computers, so there is likely to be something there for just about everyone.

See you next week.

Bud Izen
Fairfield, California

SOFTWARE FOR SPECTRUM AND ZX81

OUR POLICY

We aim to create programs which you will keep on using until your computer wears out. You won't find our programs in the top ten and you will look in vain for colour adverts and fancy packaging. Nevertheless we have built up a solid following of discerning users in all parts of the world. Read the reviews of our programs if you can find them. We have been consistently praised for quality, originality and value for money.

WHAT DO YOU GET?

The bulk of our cassettes are now made by the factory which produced the Horizons tape. Programs are recorded twice and carry on the reverse side an audio narrative to supplement the operating instructions. Where appropriate, cassettes are accompanied by a comprehensive and clearly written instruction manual.

48K SPECTRUM

"Day of the Match" £5.00

Fascinating and realistic simulation of an entire football season. Name your own teams if you wish (English league provided on cassette). Rate each team from one to nine in various success categories such as attack, defence, manager, etc. Watch the season unfold. Includes knock-out cup option.

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Simulates a test match series or one day international series. Set up your own teams and pool of players (England v Australia provided). Rate each player's capabilities as batsman and bowler on a one to nine scale for qualities such as talent, effort, etc. Pick your teams and play the match. Electronic scoreboard shows progress of a match. Full supporting score card and series averages.

"Superplan Generator" £12.00

Spreadsheet type program with variable column width and variable number of columns. Lets you sacrifice columns you don't need to get more lines.

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Simple but effective information display. Up to 42 pages of text and low-res graphics. Access pages on demand or run in perpetual 'slide-show' mode. Full facilities to create your own pages and build up an information library on cassette.

16K SPECTRUM

"Superdraw" £5.00

Create full colour high-res pictures and store them on cassette for use as titles or background screens in other programs. Or just have fun doodling and build up a cassette library of your creations. Slide show option allows you to review pictures stored on cassette.

16K ZX81

Here is a selection of titles still available for ZX81. Send sae for illustrated catalogue. These are the ZX81 equivalents of the Spectrum programs described above. Although similar in concept the specifications fall short of the descriptions given for the Spectrum.

"FOOTBALL-LEAGUE"	Forerunner of "Day of the Match"	£4.00
"TEST-MATCH"	Forerunner of "Ball by Ball"	£4.00
"VIDEO-PLAN"	Forerunner of "Superplan"	£7.00
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"VIDEO-SKETCH"	Forerunner of "Superdraw"	£7.00

Many independent computer shops now stock our products but we continue to supply by mail order on an off-the-shelf, immediate delivery basis. Prices include VAT, post and packing in UK. Add a bit for postage if you live in Outer Mongolia. (Note "Day of the Match" not available until late October 1983.)

Video Software Ltd, Stone Lane Kinver, Stourbridge, West Midlands Telephone: 0384 872462

NEWS

Machine code made easy

Software writer Allen Pendle has devised a new programming language for the 48K Spectrum which, he says, makes machine code programming as easy as writing BASIC programs.

Called Scope, it is specially designed to produce high speed graphics, animation and sound. Mr Pendle believes it will rival Forth, and says he "wouldn't be surprised if it made assemblers obsolete."

Comparing Scope with Forth, he said: "The trouble with Forth is that you have to relearn the way you think — a new way of dealing with arithmetic, for example.

"Scope does everything that Forth can do, but it's compatible with BASIC. You can use it within a BASIC program."

Scope is based around 31 BASIC like commands, which refer directly to Spectrum functions. Or as Mr Pendle puts it, "you could compare it to an assembler with plain language mnemonics."

Unlike BASIC, which has to be converted back into machine code as the program is actually running, Scope is compiled into code as the program is being written.

The end result is in effect a machine code program, but when listed out it appears in the form of Scope commands.

Like Forth, several Scope commands can be used to define new command words.

The Spectrum version of Scope occupies about 2.7K of memory, and costs £11.95 on cassette.

But Mr Pendle plans to bring out a version for the Commodore 64 soon, and for other machines later.

He said: "There's very little you can't do with Scope, but I'm still developing it. Later I'll be producing a toolkit which people can use to update the original program."

ISP Marketing, Crown House, 38B High Street, Godalming, Surrey

Data's in the air

Radio West's Datarama show will be on the air again every Sunday at 5 pm.

Datarama was first broadcast earlier this year, and its claim to fame is that it was the first programme to include regular software transmissions for micros including the Spectrum and ZX81, BBC, Dragon, Atari, Oric, Commodore 64 and Newbrain.

As well as software broadcasts, the new series will review new hardware and software, cover what's happening in the microcomputer industry and give news of computer user groups.

Radio West, based in Bristol, also plan to broadcast a workshop-style course for first-time computer users.

As before, the data transmissions will be supplemented by longer programs broadcast after Radio West closes down at 1 am. These are repeated at 15-minute intervals through the night.

Producing as well as presenting Datarama are Radio West's chief engineer, Tim Lyons, and senior engineer Martin Schummer, both keen micro fans.

Radio West's covers about 1 million people in the Bristol, Bath and Avon area, but if you're not sure whether you are in the reception area, send an SAE to Radio West for advice.

Radio West, PO Box 963, Watershed, Canon's Road, Bristol BS99 7SN

After failing his driving test, programmer Tim Boone decided to take it out on his Spectrum. The result was Double Trouble, a machine code game at £5.90 in which the player must protect pedestrians from mad motorists. Double Trouble is Tim's first game under his own label, Starlite Software.

Starlite Software, 1 Mercury Close, Lordshill, Southampton SO1 8BH

Arabian bytes

The ZX81 has really been seeing the world lately. A few weeks ago (HCW 30) we reported that it might go on sale in China. Now a company called Autoram has brought out an add-on which, it claims, will open up a potential market of 100 million Arabs who have been waiting "to enter into the exciting world of computing."

Called the Arab RAM, the unit plugs into the back of the ZX81 like an ordinary RAMpack and enables it to display Arabic characters — from right to left, of course, though decimal numbers are still evaluated from left to right.

It also translates all keywords and function names so that the ZX81 can be programmed in an Arabic version of BASIC, which Autoram is calling Saudia.

Along with the Arab RAM, Autoram provides a keyboard overlay with Arabic characters and words and an Arabic instruction manual to supplement the Sinclair manual.

Autoram, PO Box 147, Jeddah, Saudi Arabia

Join the web wars, and trap the enemy spiders

A colourful spider's web is the setting for Michael Diskett's VIC-20 game. But those graphics eat up a lot of memory, so you'll need 16K expansion

If you are the sort of person who hates spiders, then this game will give you nightmares.

It uses the graphics of the VIC-20 to the full to display a spectacular view of a spider's web.

You are the green spider in the centre of the web, and you're surrounded by four black spiders. Your task is to clear the black spiders out of the web.

The way to do this is to wave your own small web. If a black spider should run into your web, you must move over to it as quickly as you can, and weave another web over the trapped spider to kill it.

How it works

4-195 define character
200-410 PRINT web on screen
510-515 set variables
520-530 display spider
555-698 add extra spider when rest cleared
700-820 display spider in a new position
900-960 check if spider has caught you
1000-1009 check if key is pressed
1010-1026 display small web if appropriate key is pressed
1029-1080 check key pressed
1090-1500 move in appropriate direction
1600-1800 check joystick position
2000-2050 death routine
2500-2720 hall of fame
5000-6010 display instructions

If you are too slow, though, the spider will escape.

You have one minute and 30 seconds to kill all the spiders. If you manage this, then the game will start again, with an extra spider to kill.

Controls: You can move the green spider by using either a joystick or the following keys:

Q north west
W north
E north east
D east
c south east
x south
Z south west
A west
S weave a small web

You can only move along a thread. You cannot jump from one thread to another, and when you weave a web it will be positioned in the direction you last moved.

So if you had just moved north (W), then when you wove a web, it would be placed in the next position above you.

Typing in: Before you type in the program you must first enter the following
10 POKE 642,32: SYS64824

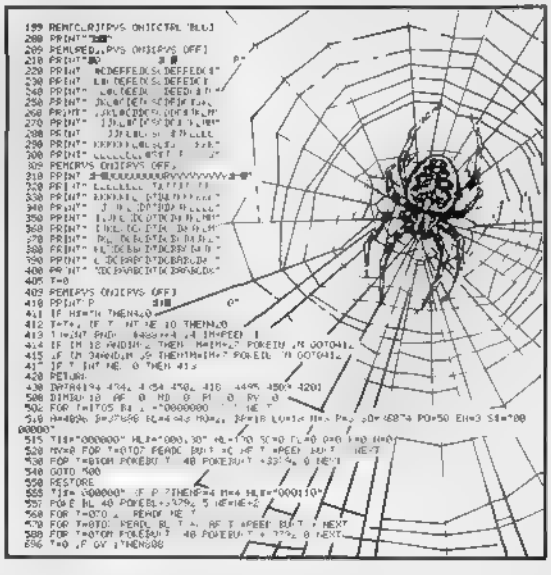
Hints on conversion

Conversion should not be too difficult as long as you know where the screen is stored in memory, so you can directly POKE characters on to the screen.

Once you have typed this in you should SAVE it, then run, then type in the main program, and save it after the one just saved. Graphics symbols are explained in REMarks above them.

Variables

TI$ built-in clock
A top left hand corner of screen memory
BU(?) holds position for black spider
AF(?) holds character under black spider
B top left hand corner of colour memory
BL position for green spider
MO next position for green spider
BP holds current AF(?) amount
SO first sound channel
EN amount of lives
S$ score including extra noughts
MD(?) position behind each black spider
GY amount of time left for spider trapped in small web
X(?) random number to decide next position for green spider
CL amount of small web weaved
M amount of black spider left
P amount of black spider for next game



```
697 X(T)=INT(RND(1)*9)+1
698 GOTO700
699 T=0
700 POKESO,200 IF T MTHEN699
701 IF GV>0 THEN 802
702 IF PE=1THEN1028
710 ON X(T) GOTO745,750,755,760,765,770,785,775,790
745 MO=-22 A1=0 A2=15 A3=19 GOTO790
750 MO=-21 A3=36 GOTO810
755 MO=+1 A1=0 A2=7 A3=22 GOTO790
760 MO=+23 A3=38 GOTO810
765 MO=+22 A1=8 A2=15 A3=20 GOTO790
770 MO=+21 A3=37 GOTO810
775 MO=-23 A3=35 GOTO810
780 T=T+1 X(T)=INT(RND(1)*9)+1 GOTO700
785 MO=-1 A1=0 A2=7 A3=21
790 X9=PEEK(BU(T)+MO)
791 IFX9=A3ORX9=18ORX9>=A1ANDX9<=A2ORX9<23ANDX9>18ORX9<39ANDX9>34THEN794
793 GOTO900
794 BU(T)=BU(T)+MO MD(T)=MO
800 POKESO,0 POKEBU(T)-MD(T),AF(T) AF(T)=PEEK(BU(T)) POKEBU(T),40 POKEBU(T)+337
92,0
801 POKEBU(T)-MD(T)+33792,2 T=T+1
802 C$=VAL(HL$)-VAL(TI$) TT$=STR$(C$) N=LEN(TT$) TT$=LEFT$("00000",6-N)+RIGHT$
(TT$,N-1)
803 PRINT"C"S$ PRINT"TT$ REM[HOME][RVS ON][BLU][CRSR RI
GHT]
804 IF TI$<HL$THEN 807
805 PRINT"     OUT OF TIME      " FOR T=0TO5000 NEXT T TI$="000000" HL$="0000
60"
806 POKEBL,BP POKEBL+33792,2 GOTO201
807 GV=GV-1 POKESO,0 IFJO$="1"THEN1600
808 GV=GV-1 POKESO,0 GET A$ IF A$="" THEN700
809 GOTO1000
810 X9=PEEK(BU(T)+MO) IF X9=A3 ORX9=18THEN BU(T)=BU(T)+MO MD(T)=MO GOTO800
811 IF X9=50 THEN 815
812 GOTO830
815 IF PEEK(BU(T)+MO+33792)=5 THEN900
820 B5=X(T) X(T)=INT(RND(1)*9)+1 IF X(T)=B5THEN820
825 IF X9=39 THEN2000
830 GOTO 699
900 IF X9<>50 THEN 903
901 BU(T)=BU(T)+MO MD(T)=MO POKEBU(T),52 POKEBU(T)-MD(T),AF(T) AF(T)=50
902 POKEBU(T)+33792-MD(T),2 GV=150 HE PE=1 GOTO808
903 IF PEEK(BU(T)+MO+33792)=5 THEN820
905 REM
910 POKEBU(T),AF(T) POKEBU(T)+33792,2
915 BU(T)=BU(T)+MO MD(T)=MO
920 FOR IT=0TO10
930 FOR HE=0TO150 NEXT HE POKEBU(T)+33792,5
940 FOR HE=0TO150 NEXTHE POKEBU(T)+33792,0
950 NEXT IT
95  EN=EN-1 IF EN<1THEN2500
954 POKESO,0 AF(T)=BP
956 POKE198,0
960 BP=AF(T) GOTO2020
1000 IF D$="N"THEN1005
1001 IF RND(1)<HE.200THENLI=INT(RND(1)*480)+4114 IF PEEK(LI)=40ORPEEK(LI)=52THE
N1001
1002 POKELI,32
1005 POKE198,0
1009 IF A$="Q"THENMY=-23 A2=38 A3=35 GOTO1120
1010 IF A$="S"THENAQ=PEEK(BL+MY) GOTO1012
1011 GOTO1029
1012 IF AQ=50THEN1018
1013 IF AQ=52THEN TY=1 GOTO 1018
1014 IF AQ=40THEN1029
1015 IF CL>8THEN700
1016 AU(O)=BL+MY AV(O)=AQ O=O+1 CL=CL+1
1017 POKEBL+MY,51 POKEBL+MY,50 GOTO700
1018 FOR T=0TOO IF BL+MY<>AU(T) THEN NEXT T
1019 POKEBL+MY,AV(T) CL=CL-1
1020 FOR DI=TTOO AU(DI)=AU(DI+1) AV(DI)=AV(DI+1) NEXT DI O=O-1
1021 IF TY=0THEN700
1022 FOR KT=0TOM IF BL+MY<>BU(KT)THEN NEXTKT
1023 PO=PO+50 SC=SC+PO S$=STR$(SC) N=LEN(S$) S$=LEFT$("000000",8-N)+RIGHT$(S$,N
-1)
1024 FORDI=KTTOM BU(DI)=BU(DI+1) AF(DI)=AF(DI+1) NEXTDI TY=0 GV=0 PE=0 M=M-1
1025 IF M<0THENFORT=0TO800 NEXT P=P+1 POKEBL,BP POKEBL+33792,2
1026 IF M<0THENM=P BL=4348 BP=18 MY=22 GOTO550
1027 GOTO700
1028 PE=0 GOTO700
1029 IF A$="W"THENMY=-22 A1=8 A2=15 A3=9 GOTO1090
1030 IF A$="E"THENMY=-21 A2=37 A3=36 GOTO1120
1040 IF A$="D"THENMY=+1 A1=0 A2=7 A3=22 GOTO1090
1050 IF A$="C"THENMY=+23 A2=35 A3=38 GOTO1120
1060 IF A$="X"THENMY=+22 A1=8 A2=15 A3=20 GOTO1090
1070 IF A$="Z"THENMY=+21 A2=36 A3=37 GOTO1120
1080 IF A$="A"THENMY=-1 A1=0 A2=7 A3=21 GOTO1090
1085 GOTO700
1090 P7=PEEK(BL+MY)
1091 IFP7=A3ORP7=18ORP7>=A1ANDP7<=A2ORP7<23ANDP7>18ORP7<39ANDP7>34THEN1100
1092 IF P7=40THEN2000
1097 GOTO 700
1100 BL=BL+MY AC=MY GOTO1500
1120 P7=PEEK(BL+MY) IFP7=A3ORP7=18ORP7=A2 THEN BL=BL+MY AC=MY GOTO1500
1125 IF P7=40 THEN2000
1130 GOTO700
1500 POKEBL-MY,BP POKEBL-MY+33792,2 BP=PEEK(BL) POKEBL,40 POKEBL+33792,5 GOTO70
0
1600 POKE37139,0 POKE37154,127
1610 J=PEEK(37137) J0=-((JAND4)=0) J1=-((JAND8)=0) J2=-((JAND16)=0) F=-((JAND32)=0)
1660 T=PEEK(37152)
1670 J3=-((TAND128)=0)
1675 IF J0=0ANDJ1=0ANDJ2=0ANDJ3=0ANDF=0THEN700
1676 IF D$="N"THEN1680
1677 IF RND(1)<HE.240THENLI=INT(RND(1)*480)+4114 IF PEEK(LI)=40ORPEEK(LI)=52THE
N1677
1678 POKELI,32
1680 POKE37139,128 POKE37154,255
1690 IF J0 AND J2 THEN A$="Q" GOTO1009
1700 IF J0 AND J3 THEN A$="E" GOTO1030
1710 IF J1 AND J2 THEN A$="Z" GOTO1070
1720 IF J1 AND J3 THEN A$="C" GOTO1050
1730 IF J0THENA$="W" GOTO1029
1740 IF J1THENA$="X" GOTO1060
1750 IF J2THENA$="A" GOTO1080
1760 IF J3THENA$="D" GOTO1040
1770 IF F THEN A$="S" GOTO1010
1800 GOTO700
2000 REM DEATH ROUTINE
2005 POKESO,0
2007 FOR T=0TOM IF BL+MY<>BU(T) THENNEXT
2009 BL=BL+MY AC=MY POKEBL-MY,BP POKEBL-MY+33792,2 BP=AF(T) POKEBL,40 POKEBL+33
792,5
2012 FOR IT=0TO10
2013 FOR HE=0TO150 NEXT HE POKEBL+33792,5
2014 FOR HE=0TO150 NEXT HE POKEBL+33792,0
2015 NEXT IT
2016 EN=EN-1 IFEN<1 THEN2500
2018 REM[HOME][RVS ON]
2020 IF EN=1 THEN PRINT"  1 LIFE LEFT          " GOTO2040
2030 PRINT"    "EN" LIVES LEFT      "
2040 FOR T=0TO3000 NEXT PRINT"                      " POKE198,0 BL=4348 BP=18 MY
=22 PO=0
2050 POKEBL,40 POKEBL+33792,5 GOTO699
2500 REM HALL OF FAME
2510 POKESO,0 I=0 FOR I=1TO5 IFSC>VAL(LEFT$(B$(I),6)) THENK=I I=5
2515 NEXT I
2518 REM[CLR][RVS ON]
2520 IF K=0THEN2600
2525 PRINT"YOU ARE IN THE TOP 5" POKE198,0
2526 REM[RVS ON][CRSP [HH]
```

```
2530 PRINT"ENTER YOUR INITIALS" INPUT"";A$ IF LEN(A$)>3THEN2530
2540 FOR I=4TOK STEP-1 B$(I+1)=B$(I) NEXT I
2550 B$(K)=S$+" "+A$
2600 POKE36879,25 PRINT"     HALL OF FAME" PRINT
"
2610 FOR I=1TO5 PRINT"   "B$(I) NEXT I
2619 REM[CRSR DN][CRSR RT][RVS ON]
2620 PRINT"  YOU SCORED "S$
2630 PRINT"  ANOTHER GAME Y/N"
2640 GET A$ IF A$="" THEN2640
2650 IF A$="Y"THEN 2700
2660 IF A$="N"THEN SYS64824
2670 GOTO2640
2700 RESTORE
2708 REM[CLR]
2710 PRINT"" FOR T=0TO1 READA NEXT T POKE36879,25
2711 PRINT"OPTIONS Y OR N"
2712 GET A$ IF A$=""THEN2712
2713 IF A$="Y"THEN GOTO5300
2714 IF A$="N"THEN2720
2715 PRINT"" GOTO2711
2720 GOSUB200 POKE36,0 GOTO510
4999 REM  INSTRUCTIONS
5000 PRINT"
5005 REM[RVS ON]
5010 PRINT""
5015 GOSUB6030
5020 PRINT"IN THIS GAME YOU PLAY"
5025 GOSUB6030
5030 PRINT"THE PART OF A  ARANIUM"
5035 GOSUB6030
5040 PRINT"CRAZED VERY INTELIGENT"
5045 GOSUB6030
5050 PRINT"MUT ANT SPIDER  SADLY"
5055 GOSUB6030
5060 PRINT"MUT ATION HAS LEFT YOU"
```

```
5065 GOSUB6030
5070 PRINT"WEAK FOR A SHORT TIM
5075 GOSUB6030
5080 PRINT"THEREFORE THE OTHER
5090 GOSUB6030
5090 PRINT"SPIDERS WILL TRY T
5095 GOSUB6030
5100 PRINT"EAT YOU ALIVE  YOUR
5105 GOSUB6030
5110 PRINT"ONLY MEANS OF DEFENCE
5115 GOSUB6030
5120 PRINT"IS TO WEAVE A WEB TO
5125 GOSUB6030
5130 PRINT"TRAP AND CATCH OTHER
5135 GOSUB6030
5140 PRINT"SPIDERS IN TO WEAVE A
5145 GOSUB6030
5150 PRINT"WEB YOU HAVE TO PRES
5155 GOSUB6030
5160 PRINT"THE S KEY OR THE FIRE
5165 GOSUB6030
5170 PRINT"BUTTON ON THE JOYSTI
5175 GOSUB6030
5180 PRINT"IF YOU PRESS IT AGAIN
5190 PRINT"THE WEB WILL D APEAR
5200 GOSUB
5210 GOSUB 6000
5299 REM[RVS ON]
5300 PRINT"   OPTIONS FOR GAME
5301 PRINT"
5310 PRINT"YOUR FIRST OPTION
5320 PRINT"SIMPLE JUST KEYBOARD
5330 PRINT"  OR JOYSTICK  "
5340 PRINT"FOR THE HE    WHILE"
5350 PRINT"YOU HAVE TO  DELIBE"
5360 PRINT"IF YOU WANT THE WEB"
5370 PRINT"TO DECOMPOSE WHILE THE
5380 PRINT"GAME IS IN PROGRESS"
5390 PRINT"IF YOU HAVE THE HIDDEN"
5400 PRINT"BARRIER THEN WHILE YOU"
5410 PRINT"ARE PLAYING YOU COULD"
5420 PRINT"FIND YOURSELF TRAPPED"
5430 PRINT"BY THE HIDDEN BARRIERS"
5431 PRINT"THE LAST OPTION IS THE"
5432 PRINT"DIFFICULTY THE HIGHER"
5433 PRINT"THE NUMBER THE MORE"
5434 PRINT"DIFFICULT THE GAME IS"
5435 POKE198,0 POKE649,1
5450 PRINT"JOY  J  OR KEY  K "
5460 GET JO$ IF JO$<>"K"ANDJO$<>"J"THEN 5460
5469 REM[CRSR UP][RVS ON]
5470 PRINT"DECOMPOSE   Y OR N "
5480 GET D$ IF D$<>"Y"ANDD$<>"N"THEN5480
5500 PRINT"HIDDEN BARRIER  Y OR N"
5510 GET H$ IF H$<>"Y"ANDH$<>"N"THEN5510
5530 PRINT"DIFFICULTY 1-100"
5534 REM[RVS ON][2 SPACES][3 CRSR LEFT]
5535 INPUT"      "HE
5540 IF HE>ORHE<1 100THENPRINT"" GOTO5535
5550 IF T<120 THEN 2720
5950 GOSUB 6000
5960 GOTO 196
6000 PRINT"    PRESS A KEY"
6010 GET A$ IF A$=""THEN6010
6020 RETURN
6030 FOR T=1000TO0 STEP-1 NEXT RETURN
```

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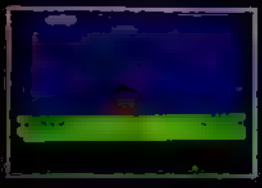

The Birds and The Bees is an original animated cartoon-style game, introducing, for the first time on screen, Boris the Bee. Boris must collect as much nectar as possible, whilst avoiding various nasties like birds, wasps, centipedes and Venus fly traps. Smooth, fast machine-code action throughout, with sound effects, joystick option (most types) and speech option with the Currah Microspeech Unit.

Author: Adrian Sherwin with graphics by Matthew Smith (of Manic Miner fame)

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Arcade innovations

No boring old space monsters in this collection of new arcade games. Like the sound of them? Read what our reviewers thought

Roo TI-99/4A (Extended BASIC) £7

By SP Software, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

Run, climb, jump, punch and duck your way along three different screens in order to reach the baby kangaroo that some wicked monkeys have stolen

The first screen shows four levels with a ladder leading to each level. Your kangaroo must climb to the top for access to the next screen

Apples whizz across each level, and unless dodged or punched will knock down Roo, and one of his three lives will be lost

In the second screen, Roo is bombarded by those apples again as he attempts to jump up and across logs suspended from vines It's no use trying to duck his way round this time, however, so apples must be firmly punched.

In the final screen Roo's poor joey is held aloft on a central column of monkeys. Only by punching these evil primates, one at a time, will the captured baby be recovered.

Control of Roo is from the keyboard, and with so many different actions he can make, sustained concentration as well as deft fingerwork is required to succeed

J.W.

instructions	60%
playability	80%
graphics	90%
value for money	80%

★★★★

Halloween TI-99/4A (Extended BASIC) £7

By SP Software, from Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH

As the title suggests, there's a decidedly spooky theme to this arcade type game, Halloween

On Halloween night, five children are happily having a party in their garden when in the nearby castle the ghouls awake

In the first attack wave, witches on broomsticks fly across the screen from the castle, at various heights

Unless fired upon by your gun, which may be moved between castle and house, the children will be picked up one at a time and carried back to the witch's lair.

Successfully destroying a witch, however, gains points and a score and high score are displayed.

When 10 witches have been obliterated the attack is continued by devils who lance each child with their spear — very nasty!

The game progresses with the ghouls becoming more terrifying until all the children have gone, when you have the chance to play again.

There is optional use of keyboard or joystick to move and fire your gun

J.W.

instructions	75%
playability	60%
graphics	60%
value for money	65%

★★★

Shark Treasure Dragon £12.95

Dragon Data, Kenfig Industrial Estate, Port Talbot

You take the role of a treasure hunter who has discovered the wreck of a Spanish galleon.

To recover the treasure, you must hire divers for $1000 each (why dollars from a Welsh company?) You begin with $2000 and initially the treasure is worth $1000 apiece

The divers start at the top of the screen and you must get them to the sea-bed at the bottom of the screen, collect the treasure and then guide them back up. Sounds easy, doesn't it?

There are however a few complications. Large sharks are patrolling the waters and your divers are very likely to get eaten by them

The divers carry some limited protection in the form of flash grenades which can temporarily disorientate the sharks. The shark graphics are really superb, and caused the occasional roar of laughter

Progressive levels of difficulty mean that more and more sharks appear each time a diver manages to get back with the gold or jewels.

After all that, there is one big disappointment with Shark Treasure — the price Come on, Dragon, don't you know that the price of software is a major factor when the consumer decides on a home computer?

D.W.J.

instructions	100%
playability	96%
graphics	92%
value for money	50%

★★★★

Gunsmoke 32K BBC £7.95

Software Invasion, 50 Elborough Street, London SW18 5DN

Do you long to get out of the rut of shooting bug eyed monsters from outer space? Yes? Well, this is the program for you.

In Gunsmoke, you are plunged into the old Wild West as a gunfighter, and only quick reactions can save you from the bad guys.

This package takes a fair time to load, in three parts first the instructions and then the background scene This is a typical western town with good graphics of a saloon, sheriff's office, store and barn

After Part Three loads, a tune is played and you start the shootout

It takes a lot of practice to even survive, let alone kill one of the baddies.

But this makes the game that much more of a challenge, and will maintain long-term interest, long after the usual zap pow games have been relegated to the back of a drawer

Good graphics, sound effects and music — Software Invasion have set themselves a high standard to keep up Good luck to them All in all, very good value for money

J.H

instructions	90%
playability	90%
graphics	95%
value for money	95%

★★★★★

Saloon Sally 34K BBC £7.95

Psion, 2 Huntsworth Mews, Gloucester Place, London NW1

Psion is well known for its excellent Spectrum software, and this is one of its first offerings for the BBC.

Saloon Sally, our heroine, is the hostess of a Wild West saloon. Unfortunately a drunken brawl has developed between a group of cowboys.

Sally has to run around the saloon avoiding the cowboys, while attempting to collect bars of gold which have been left lying around the tables.

Tables placed around the saloon can be pushed around by Sally to allow her to collect the gold. Careful positioning of the tables also helps to control the cowboys

The pianist continues to play the honky tonk piano throughout the game.

I found this game highly addictive. A certain amount of skill is needed as well as just quick reactions. The controls are well chosen and easy to master

The instructions are printed on the cassette inlay, but are not displayed on the screen. There is no explanation of the scoring system. A table of high scores is maintained starting at 1000 points, which I found difficult to achieve during the review period

On the whole, though, a very enjoyable game — recommended.

G.T.

instructions	50%
playability	90%
graphics	80%
value for money	75%

★★★★

Not one, not two...

...but three games to fit into your 1K ZX81. Philip Moriarty explains what they are and how to play them

Space Run

In this moving graphics game, you have to steer your ship through an asteroid field, picking up aliens and trying to keep your fuel from running out.

The aliens give you 10 credits every time you pick one up, and the amount of credits you have at the end is your score.

The game ends in one of two ways — when your ship crashes into an asteroid or when you run out of fuel.

When you have less than 20 units of fuel left, your ship changes into an inverse X.

The only way to keep your fuel level up is to crash into one of the fuel dumps (inverse F) which are worth 20 fuel points.

How it works

10-40 initialise variables
50-70 print ship, asteroids, fuel and aliens on screen, move ship, and scroll screen up
90-101 decrement fuel, check fuel level and act accordingly
105-150 check to see if the ship has collided with anything, act accordingly, return to line 50
210-280 end routine

Graphics symbols used

CHR$ 187 or **CHR$ 189** your ship
CHR$ 139 alien
CHR$ 23 asteroid
CHR$ 171 fuel dump

Variables

HI hi-score
S score
**A$** CHR$ used for ship
Y Y co-ordinates of ship
F fuel
P PEEK to check if the ship has collided

```
  10 LET HI=VAL "50"
  20 LET S=VAL "0"
  25 LET A$="[illegible]"
  30 LET Y=VAL "10"
  40 LET F=VAL "100"
  50 PRINT AT 0,Y;A$;AT 7,RND*20
;"*"
  55 LET Y=Y+(INKEY$="8")-(INKEY
$="5")
  60 SCROLL
  70 IF RND>.9 THEN PRINT AT 7,R
ND*20;"[illegible]";AT 7,RND*20;"[illegible]"
  80 LET F=F-1
 100 IF F<1 THEN GOTO 200
 101 IF F<20 THEN LET A$="[illegible]"
 105 PRINT AT 0,Y;
 110 LET P=PEEK (PEEK 16398+256*
PEEK 16399)
 120 IF P=23 THEN GOTO 200
 125 IF P=139 THEN LET S=S+10
 130 IF P=171 THEN LET F=F+20
 150 GOTO 50
 210 CLS
 215 IF F<VAL "1" THEN PRINT "[illegible]
[illegible]"
 220 PRINT "[illegible]";S;"[illegible]"
 225 IF S<HI THEN GOTO VAL "270"
 240 PRINT "[illegible]"
;HI
 245 LET HI=S
 270 PRINT "[illegible]";HI
 280 PAUSE VAL "4E4"
 285 CLS
 290 GOTO VAL "20"
```

Simon

A 1K version of the popular Simon memory game. I have used letters in this version.

Most people know the rules, but here is a brief resumé.

The computer displays a letter — type it back in.

If you do this correctly the computer adds another letter and so on — until you finally type in the wrong code.

How it works

2-20 sets up introduction and lets score = 0
30-57 picks a random letter, adds it to the code, displays code on screen for a short time
60-90 input your answer, check it, if it's right increment score and GOTO 40, if not GOTO 150
150-180 "lost" routine

Variables

S score
A$ code
G control variable of loop for pause
B$ your answer

```
   2 CLS
   5 LET S=CODE "[illegible]"
  10 PRINT "[illegible]
[illegible]"
  20 PRINT ,,"LETTERS ARE USED I
N THIS VERSION OF THE POPULAR ME
MORY GAME."
  30 LET A$=""
  40 LET A$=A$+CHR$ (VAL "38"+RN
D*VAL "6")
  50 PRINT ,,,,"[illegible]";A$;
  55 FOR G=CODE "[illegible]" TO VAL "300/
S"
  56 NEXT G
  57 CLS
  60 INPUT B$
  70 IF B$<>A$ THEN GOTO 150
  80 LET S=S+CODE "[illegible]"
  90 GOTO VAL "40"
 150 PRINT "[illegible]",B$,,"[illegible]
[illegible]",A$
 155 PRINT "[illegible]";S;
 157 IF S>15 AND S<20 THEN PRINT
"-VERY GOOD"
 158 IF S>20 THEN PRINT "-EXCELL
ENT"
 159 IF S<5 THEN PRINT "-HOPELES
S"
 160 PRINT ,,,,"PRESS ANY KEY."
 165 [illegible]
 170 PAUSE VAL "4E4"
 180 RUN 2
```

ZX Pontoon

This is an implementation of the popular card game Pontoon, where the players try to get as close as possible to a total of 21.

You always play first, and if you exceed 21 the ZX81 wins automatically.

How it works

1-6 initialise variables
15-70 main game section (for human)
100-150 ZX81 victory
200-250 main game section (for ZX81)
300-330 draw
400-420 human victory
430-470 end of game

When you input S the ZX81 starts, and keeps going until it beats your total, and therefore wins, or exceeds 21 and "busts".

There are 10 rounds to a game, and in my experience the ZX81 usually wins at least five of them.

Variables

HV number of human wins
ZV number of ZX81 wins
G control variable of "round" loop
A total of human's cards
U total of ZX81's cards
H human's card
M ZX81's card

```
  1 LET HV=CODE " "
  2 LET ZV=HV
  4 FOR G=VAL "1" TO VAL "10"
  5 LET A=CODE " "
  6 LET U=CODE " "
 15 PRINT "[redacted]";0
 30 PRINT "N/L=DEAL:S=STICK"
 41 INPUT A$
 42 IF A$="S" THEN GOTO VAL "20
0"
 45 LET H=INT (RND*VAL "10")+CO
DE "■"
 46 LET A=VAL "A+H"
 50 PRINT AT VAL "10",VAL "5";"
HUMAN:";A
 60 IF A>VAL "21" THEN GOTO VAL
 "100"
 70 GOTO VAL "41"
100 PRINT "[redacted]"
110 LET ZV=ZV+CODE "■"
120 PAUSE VAL "100"
130 CLS
160 NEXT G
199 GOTO VAL "430"
200 LET H=INT (RND*VAL "10")+CO
DE "■"
210 LET U=U+H
220 PRINT AT VAL "12",VAL "5";"
ZX ";U
230 IF U<VAL "21" AND U>A THEN
GOTO VAL "100"
231 IF U=VAL "21" THEN GOTO VAL
 "100"
235 IF U>VAL "21" THEN GOTO VAL
 "400"
240 IF U=A THEN GOTO VAL "300"
250 GOTO VAL "200"
300 PRINT "[redacted]"
```

```
310 PAUSE VAL "100"
320 CLS
330 NEXT G
400 PRINT "[redacted]"
410 LET HV=HV+CODE "■"
411 PAUSE VAL "100"
412 CLS
420 NEXT G
430 PAUSE VAL "100"
440 PRINT "[redacted]";ZV,"[redacted]";HV
450 IF ZV>HV THEN PRINT "[redacted]
8"
460 STOP
470 PRINT "[redacted]"
```

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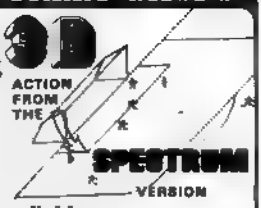

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IF YOU have always wanted to manage a football team, FOOTBALL MANAGER, from Addictive Games, is for you — The game is ideal for a football fanatic but the most interesting thing for us was the 3-D graphics used to create the goalmouth action — the game is a winner.

Although I'm no great football fan, I really enjoyed playing this game — excellent use is made of colour and user-defined graphics. The game is very logically put together, so that the development of strategy and tactics has a real effect. For example, one of my teams got through to the fourth round of the F.A. Cup where it was beaten by a second division side. This upset morale and meant that our promotion bid failed. Perhaps I should have given us the F.A. Cup run and held some good players back — the possibilities are endless. Brian Clough had better watch out!

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Possibilities to explore

Our intrepid review team set out to investigate a selection of adventure games. Here's what they found out

Aztec Tomb Commodore 64 £7.95

Alligata, 178 West Street, Sheffield S1 4ET

Alligata has done some good action software, notably Bat Attack for the 64 and Bug Blaster for the Beeb.

This adventure is in the same league — good, but not stunning.

Aztec Tomb contains some minor grammatical and spelling mistakes, such as "I wearing it" and "beanstork", but for me this did not detract from the game.

The vocabulary is quite limited, with no words like ON, OFF or READ.

What makes the game special is the use of graphics — there's a different picture for each location.

No hi-res or sprites, but block graphics combined with clever use of colour produce some very good pictures. The text usually tells you what you need to know.

The actual adventure is quite difficult, and could do with a help envelope. You need to get pretty desperate to try some of the silly things that are necessary.

This is good value for money, and one of the best adventures I've played on the 64, but once the expensive American stuff becomes available, competition will really hot up. **S.J.R.**

instructions	30%
playability	90%
graphics	90%
value for money	85%

★ ★ ★ ★ ★

Tutankhamun 48K Spectrum £5.95

Micromania, 14 Lower Hill Road, Epsom, Surrey KT19 8LT

This is a maze/adventure/arcade style game where you wander through the tomb of the Boy King, collecting treasures as you go.

There are also a number of locked doors which must be opened with the keys that you also find, and monsters all bent on your destruction, which must be killed.

You may start in any one of the first five rooms and work your way through from there.

Your defences are a laser blade which only works from side to side, so you must watch out for the vertical pathways, and a smart bomb.

This clears the screen of all monsters, but you must be quick as they are generated immediately and believe me, there are a lot of them.

In fact, I found that this was the only criticism I had of the game — there seems to be no end to them and therefore no real sign of victory over them.

Nevertheless, it can be done, and it is an enjoyable game. **N.B.**

instructions	80%
playability	85%
graphics	95%
value for money	95%

★ ★ ★ ★ ★

Tunnels of Doom TI-99/4A £24.95

From TI dealers

This graphics adventure cartridge comes complete with lengthy manual and a cassette containing data for the games Pennies and Prizes and Quest of the King.

The former is intended as a demonstration of the latter, but is also described as suitable for younger children.

Both programs have been recorded twice on separate sides of the tape — just as well since one copy of Quest of the King failed to load.

In both games you must explore dungeons and corridors. The objective in Pennies and Prizes is simply to collect specific items and plenty of pennies.

On the third time of playing this, the character display for my traveller changed to a series of disjointed dots. Quitting and trying again had the same very weird effect.

Fortunately the same bugs don't appear to be in Quest of the King, which is a far more involved and entertaining game. Here you control up to four travellers with individual personalities, from rogue to wizard, which determine their various capabilities.

Your quest is to first find the king, held captive by the monsters that roam the dungeons, then his orb of power, after which you may return to victory or continue the treasure hunt. **J.W.**

instructions	90%
playability	60%
graphics	80%
value for money	60%

★ ★ ★

Aztec Gold TI-99/4A (Extended BASIC) £6.95

Lizard Games, 14 Bridgewood, Brookside, Telford, Shropshire

Never heard of Quetzalcoatl? Well, you could be an expert on this and all the other Aztec gods after playing the adventure game Aztec Gold.

Set on the lost island of Tencoatl you find yourself the sole survivor of a shipwreck. After salvaging a few belongings washed ashore, you set off to explore the island in search of precious statues hidden by the Aztecs.

Progress is very slow, as no list is provided of commands in the computer's vocabulary and there's no HELP. One good feature, however, is that you can SAVE your current position when frustration sets in.

The suppliers offer to provide clues or a solution should you become permanently stuck in one location — I'd have been very tempted too if I didn't have the copy to review!

The program itself is a master for any adventure because it is entirely data driven, the program being loaded first then data read from files.

Although you pay £6.95 for this cassette, other adventures will be available at a later date which will contain data only and, the suppliers claim, cost only about half the price. **J.W.**

instructions	70%
playability	70%
graphics	n/a
value for money	90%

★ ★ ★ ★ ★

The Pyramid 48K Spectrum £5.50

Fantasy Software, 27A St Georges Rd, Cheltenham

This pyramid game boasts 120 chambers on 15 levels with 60 weird and exotic aliens.

I entered the first chamber, having taken on the mantle of Ziggy, space creature, and encountered what looked like flying dustbins — scrolling dustbins to be more accurate.

I zapped a few dustbins and finally caught an energy crystal which allowed me to leave the chamber by neutralising the force field at the exit.

I now entered the second chamber, to be confronted by stars, but the game plot remained unchanged.

After negotiating a chamber, you are shown a screen picture of the complete pyramid and a key number is displayed for the chamber just negotiated. These numbers form part of a puzzle competition — details to be announced later.

Exploring 120 chambers is an intriguing proposition, but since the instructions imply that the fundamental game plot remains unchanged, the whole thing could become a little tedious in time.

The graphics are excellent and objects disintegrate nicely when zapped. **M.B**

instructions	90%
playability	90%
graphics	90%
value for money	90%

★ ★ ★ ★ ★

At last, a really useful renumber program

Most renumber programs for the Spectrum don't do the whole job. This one does... and it works on 16K or 48K models. Nigel Dore explains how it works

There have been many renumber programs published for the Spectrum, but they all suffer from one problem — none renumbers GOTOs and GOSUBs! This makes them almost useless.

My program renumbers GOTO, GOSUB, RUN, RESTORE and LINE as well as the line numbers. It should renumber all programs except those which contain calculated line numbers which no renumber is capable of handling.

However, the program does not crash if it finds a calculated line number. It simply informs the user where it is so that he/she can alter it after the rest of the program has been renumbered.

The program should be typed into the computer exactly as shown but REMs should be omitted to allow more space for the program to be renumbered, especially on the 16K Spectrum.

As soon as the program has been typed in you should SAVE it on tape in case you have made a mistake in the machine code.

To renumber a program you now simply MERGE the renumber with the program you wish to renumber and type RUN 9500.

All other errors are also notified to the user. As the renumber routine uses line numbers 9500-9980 the program to be renumbered should not have line numbers which exceed 9500.

The screen should clear and you will be asked for a starting line number and the step between each line. The input is fully error trapped, not allowing negative or decimal inputs or a step size of zero. The computer should keep you informed of what is happening all of the time, telling you of any errors. When the renumber is complete you will be asked if you wish the renumber to self destruct. If you reply positively most of the renumber will be removed from memory.

The program first of all renumbers the GOTOs etc. by counting how many lines into the program their destination is and thus calculating the line numbers to which they will be altered.

The line number in a GOTO is then changed and the five bytes following it which give the line number in binary floating point form are also changed.

If the line number has more digits than the original then the machine code routine which is stored in the printer buffer is called to open up extra space. Finally the actual line numbers are altered in sequential order. The self destruction of the program is achieved by making the start of variables the start of the renumber routine and the clearing the variables with the CLEAR command. The various parts of the program are all clearly identified by REM statements.

How it works

- **9501** first part causes jump to routine to enter machine code. The rest erases renumber program from memory if required
- **9502** clears screen and gets input of starting line and step
- **9505-9508** check inputs for errors
- **9509-9511** print message and read line number and length
- **9520** complex line which checks to see if there is a command which needs its argument altering
- **9530** skips past five byte binary form of constants in program. Returns to 9520 if (colon) or THEN detected
- **9540** check for end of line
- **9545** check for command LINE and loop to 9530
- **9549-9553** read old line number and check not computed
- **9565** evaluate line number and check not too large
- **9580-9600** calculate new line number by counting number of lines destination line is into program
- **9600-9615** check if space for new line number, if not enough then GOTO routine to expand space else change line number
- **9620** by PEEKing at variable Z, correct bytes after line number
- **9655-9660** expand space
- **9700-9720** renumber line numbers of lines in sequential order
- **9750-9760** renumber complete — ask if program to be erased. If yes then jump to second part of line 9501 by poking system variables NEWPPC and NSPPC (see manual)
- **9800** print and erase any error messages
- **9970-9980** POKE machine code into printer buffer

Machine code shifts memory to make space to make line numbers larger than original including changing necessary system variables

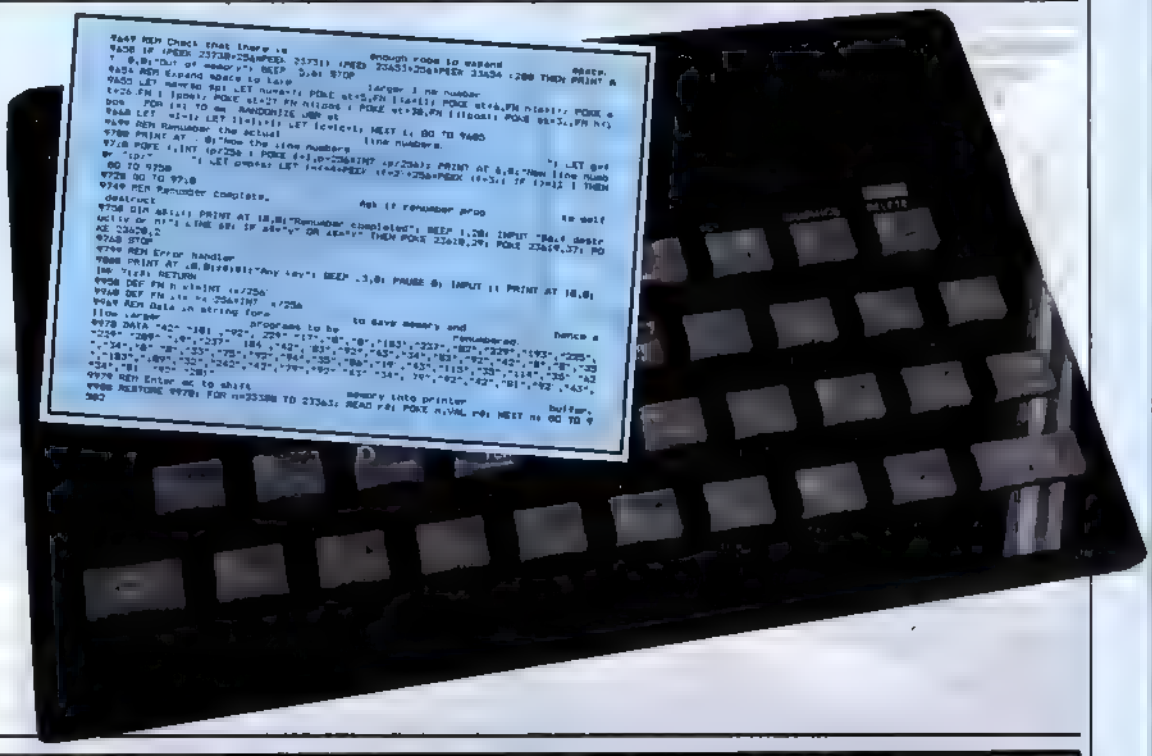
Hints on Conversion

The program is highly machine specific and conversion to other systems is impracticable. However the basic method of the program should work on most other systems.

Variables

- **a** current address being checked for commands involving line numbers
- **f** address of line number being changed
- **st** start address of machine code = 23300
- **fl** address of end of program to be renumbered
- **cc** number of lines in program
- **p** starting line
- **s** step between lines
- **l** length of current line
- **b** address of start of a line
- **nl** the characters of the line number to be changed
- **nn** line number to be changed
- **g** address of line being counted to compute new line number
- **np** number of characters in line number to be changed
- **cnp** number of characters in new line number
- **nnn** number of characters by which new line number is greater than old
- **lpos** address of two bytes giving length of a program line
- **z** variable used to convert line number to five bytes binary
- **zs** message to be printed in event of an error
- **q** general storage
- **i** used in FOR-NEXT loops

```
9500 REM renumber by N.Dore
9501 GO TO 9980: POKE 23627,PEEK 23637: POKE 23628,PEEK 23638: CLEAR
9502 BORDER 7: PAPER 7: INK 0: CLEAR : PRINT "Renumber by N.Dore": LET cnd=1: INP
UT "Input starting line ";p: INPUT "Input step ";s: LET a=PEEK 23635+256*PEEK
23636: LET fl=a
9505 PRINT "      Check no input "
9506 REM Check input for errors
9507 LET st= 23300: LET cc=0: FOR i=a TO 99999: LET a=PEEK i+256*PEEK (i+1): IF a
=9500 THEN LET cc=PEEK (i-2)+256*PEEK (i-1): LET fl=i+4: NEXT i
9508 LET l=s+p: LET z=65536: IF p<1 OR p>9499 OR s<1 OR p+(cc-1)*s>9499 OR s-INT
 s<>0 THEN LET z$="ERROR in input ": BEEP .2,0: GO SUB 9800: GO TO 9509
9509 PRINT AT 3,0;"To stop the GOTO,GOSUB RESTORE,  LINE and RUN"
9510 IF a=st-1 THEN GO TO 9700
9511 LET a=PEEK 23635+256*PEEK 23636+4: LET b=a: PRINT AT 5,0;"Current line=";int
 (a-PEEK 23635-256*PEEK (a+1)+4): LET a=a+4
9519 REM Search for commands                which involve                 lineno
mbers
9520 IF PEEK a=36 OR PEEK a=237 OR (PEEK a=202 AND PEEK (a-1)=34) OR (PEEK a=22
9 AND PEEK (a-1)<>0 AND PEEK (a-1)<>58) OR  PEEK a=247 AND PEEK (a-1)<>13 AND P
EEK (a-1)<>58: THEN GO TO 9530
9530 LET a=a+ PEEK (a+1)+5+(1 IF PEEK a=203 OR PEEK a=58 THEN LET a=a+1: GO TO 9
520
9540 IF a<>a+4+1 THEN LET a=a+1: GO TO 9519
9545 GO TO 9530: PEEK a=282+1+8
9549 REM Read line number to              be changed and check              not rel
ocated
9550 LET a$= : FOR i=1 TO 5: IF PEEK (a+1+i)<48 AND PEEK (a+1+i)<>0 OR PEEK (a+1+
i)>13 THEN GO TO 9565
9552 LET a$=a$+CHR$ PEEK (a+1+i): IF (PEEK (a+1+i)>47 OR PEEK (a+1+i)<48) AND PEEK (a+
1+i)<>13 THEN LET z$="Computed line number ": GO SUB 9800: LET a=a+1+i: GO TO 9530
9564 REM Evaluate linenumber                and check not too                large.
9565 LET n=VAL a$: LET g=a: LET c=0: IF n<9499 THEN LET z$="Line number to big
": GO SUB 9800: LET a=a+1: GO TO 9530
9579 REM Co-ordinate new                linenumber
9580 LET a=PEEK (a+256*PEEK (a+1)): LET c=c+1: IF a<>255 THEN GO TO 9580
9590 LET g=g+4+PEEK (g+2)+256*PEEK (g+3): IF g<fl-1 THEN LET g=g+PEEK (g+4)+256*
PEEK (g+5)+5: GO TO 9590: REM Jump to line also
 used as program line (fl-1) = 80 SUB 9800: LET a=a+1: GO TO 9530
9595 GO TO 9600
9599 REM Check if space big                enough for new                lineno
ber and change                if so to.
9600 LET nnp=LEN a$: LET g=g+4: LET b=LEN a$: LET nnn=LEN a$: IF nnp<=p
THEN GO TO 9650
9605 LET a=1: FOR i=1 TO nnp: POKE a+j,CODE a$(i): NEXT i: LET a=a+nnp
9610 LET a=a+1: IF PEEK a=13 THEN GO TO 9620
9615 POKE a,32: GO TO 9610
9619 REM Correct line bytes                after renumber.
9620 FOR i=1 TO 5: POKE a+i,PEEK (PEEK 23627+256*PEEK 23628+i): NEXT i: GO TO 95
30
```



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This teacher's a Dragon!

These Dragon programs aim to help young children learn while they play. Our reviewers tried them out

Number Gulper Dragon 32 £10.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot

This is the Dragon version of the mathematical game in which you have to guide a Pacman-like creature around the screen, eating numbers and signs to make a preset total.

It is written entirely in machine code and auto-runs on loading. There are keyboard and joystick options and plenty of levels of difficulty

The display is rather cluttered, with several different boxes displaying your progress to date

At the higher difficulty levels, where the action is very fast, steering the gulper presents at least as many problems as the arithmetic.

Persuading the gulper to eat the numbers as he passes them also takes a little practice

One irritating point is that the signs follow the numbers rather than preceding them, e.g. 5/ means divide by five. This may confuse some children

The instruction leaflet is comprehensive but the small print suggests it is intended for adults. It would have been nicer to have children's instructions as well

However, Number Gulper compares well with the other educational software currently available, and my daughter enjoyed it. **M.N.**

instructions	60%
ease of use	60%
display	65%
value for money	75%

★ ★ ★ ★

Fun to Learn Dragon 32 £8.95

Shards Software, 189 Eton Road, Ilford, Essex IG1 2UQ

Five educational games for only £6.95 seems too good to be true, and it is! The educational value of most of the games on this tape is very low and most of them are old standbys in a not-so-new guise

The package comprises one long program with a menu from which you move onto the various games

In the first game, Count, you have to count the number of of letters on the screen as quickly as possible

Mixer could have been called Anagrams, for such it is.

Calculator is an adding-type game where you add the flashing number to your previous total Pretty boring

Starship is a Hangman variant in which an alien is trying to destroy your starship and gets one bomb for every wrong answer Fair graphics and clues for the slower student.

Codebreaker is exactly that. A code (letter/letter) is set up and then words or sentences encoded and decoded as you choose Not the most educational activity ever, but quite fun

Fun to learn is not, as it claims, "A comprehensive teaching program" — I doubt if such a package will ever exist. **D.C.**

instructions	50%
ease of use	90%
display	60%
value for money	60%

★ ★ ★

Number Puzzler Dragon £10.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot

Serious educational software for the Dragon has been fairly slow to appear, and it's good to see programs like this being produced

This is a machine-code program containing several related mathematical games suitable for primary-aged children, and an arithmetic test.

The games are based on a 3 by 3 number square The first three are a rather curious hybrid of noughts and crosses and bingo, involving addition and subtraction, some advance planning and perhaps a little too much luck They can all be played by two children, or one child against the computer

The last game involves constructing magic squares, and is much more difficult. All the games have several different levels of difficulty

The instructions are given in a small leaflet, in equally small print Presumably the parent or teacher reads them and then explains to the child how to play the game

It's a shame that the clear layout and good graphics in the games couldn't have been matched in the instructions **M.N.**

instructions	60%
ease of use	80%
display	80%
value for money	75%

★ ★ ★ ★

Hide & Seek Dragon 32 £10.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot

Written especially for Dragon by ASK the educational software specialists, this attractively packaged cassette contains a choice of picture and word games for the younger Dragon user

The games are all designed to help short term memory.

All the versions on side A and on side B are variations on the main theme. Pictures are placed in boxes either by the child or by the computer, depending on which version is played. The child has to remember which picture is in which box.

Not all the games require the child to spell, and some of them don't even require the child to read

The programs cater for a wide age range and an even wider range of abilities Full instructions and a dictionary are provided in the enclosed booklet

The graphics are excellent Each picture matches its description well and is easily recognised by even the youngest child

There are buses and cars, castles and cats, as well as basic shapes such as triangles, squares and hearts.

A little overpriced, perhaps, but all in all this is a sound educational program and well worth considering **D.W.J.**

	100%
instructions	96%
ease of use	93%
display	90%
value for money	

★ ★ ★ ★ ★

Circus Adventure Dragon 32 £7.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot

This is an adventure game for young children in which you have to make your way through a circus to the popcorn stand There are around 20 different locations, and at each one you are given a choice of two different directions in which to go.

According to the instruction leaflet, which is very brief, one of the objects of the game is to make children aware of different directions.

However, my attempts to make a map produced a rather confused mess — in some cases, for instance, the North and South paths both lead to the same place, which is hardly likely to teach children that these are opposite directions.

The program is illustrated with very crude block graphics, the text is all standard Dragon upper-case, and the sound is rather odd

As it is written entirely in BASIC I hissed it, and found that, for some unfathomable reason, the SOUND command has been used for music instead of the more sophisticated PLAY command

This is a good idea, poorly executed Many parents could themselves produce better programs for their children than this. **M.N.**

instructions	50%
ease of use	60%
display	5%
value for money	5%

★

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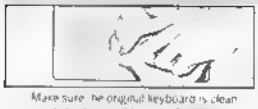

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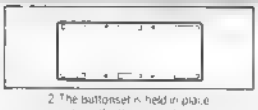

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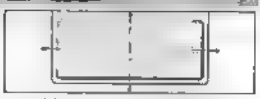

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Send your letter to Letters, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Don't forget to name your computer — the best letter could win £5-worth of software. Got a problem with your micro? We'll soon be starting a queries page, so send your technical questions to Queries at the above address

Son of Private Lines

Further to "Not so private lines 2" (HCW 37) — nice try, Andrew Turek/Alan Gee, but try MERGE " ", which allows access without any effort! Has anyone got a really effective method?

Alan Lee, Bromley, Kent

High-scoring VIC

I own a VIC-20, and I have recently got two high scores. Can any of your readers beat them?

My highest score on Llamasoft's Abductor is 63,100 and my highest on Jelly Monsters is 1,220,630. This score took me nearly 100 sheets and three hours.

By the way, my highest score on Radar Raiace is 99,500.

My mum's highest score on Blitz is 1,863 it took her seven sheets.

Barry Whatling, Tilehurst, Reading

The Dragon's a good teacher

Since many people seem to think that the Dragon does not have any good educational software, I would just like to put the record straight. I feel there are at least two titles which deserve a mention.

The first is Tell the Time, £6.50 from Abacus Software, 21 Union Street, Ramsbotham, Bury, Lancs. This program will not only teach youngsters to tell the time, but will also teach adults how to tell the time in French or German — I think it's a very good value pack, in good packaging.

Also good value at £6.95 is Maths Tutor/Kings and Queens, from Harlequin Software, PO Box 44, Ilford, Essex IG1 3DU.

These two titles could prove useful to teachers as well as parents of small children.

Philip Kirtlan, Harrogate, North Yorks

Reflecting...

I would like to thank you for the review of Stargazer Secrets in HCW 37.

Your reviewer wonders who will buy the program. Might I suggest that it should prove of interest to anyone with a slight interest in astrology, and a suspicion that there is more involved than the popular Sun Sign forecasts which divide the world population into a mere 12 categories.

Purchasers are not limited to investigating their own horoscopes, as your reviewer suggests, but can delve into the character of parents, children, or friends.

It might even be interesting to discover what makes a favourite pop star or hated politician tick. All you need is the birthdate.

There will perhaps also be a market for those more knowledgeable about astrology, but who lack the mathematical ability to calculate a horoscope, although they will probably get more use from the more specialised programs available from Astrocalc.

This firm, based at 53 Loughborough Road, Quorn, Loughborough, markets a variety of programs for a variety of machines. They are written by Colin Miles and Terry Dwyer, both competent astrologers.

It should be said, though, that these programs, unlike Stargazer Secrets, are not "fun" programs, but powerful calculation aids for the serious astrologer.

Chris Somerville, Llandudno Junction, Gwynedd

... On Stargazer

Your reviewer R.E. in HCW 37 asks who would buy the program Stargazer Secrets.

I would have thought that the answer to that was anyone who regularly draws up natal astrological charts and possesses the necessary hardware.

At least it might be — R.E. neglects to tell us the degree of accuracy that the program achieves. For example, would you get the same readout for two birthtimes separated by three minutes? And does the program calculate aspects, one of the most tedious elements of low-tech technology?

The review also fails to tell us whether the appearance of the Natal Chart as "meaningless squiggles" is due to some shortfall in the software or in the reviewer's knowledge of astrology.

I suppose it would be asking too much to be told which system of house division Chris Somerville uses (there are five that I know of, and probably more that I don't!).

I realise that many people would regard astrology as being a trivial application for new technology — but no more so, surely, than zapping aliens or wandering around the dusty caverns of some programmer's imagination.

Please, next time you get a program like this to review, give it to someone who is able to tell prospective purchasers what they need to know in order to decide whether or not to buy it.

Hilary Hayes, London NW10

We do our best to give all review tapes to the reviewer best suited to do them justice. Talented though our review panel is, however, it would be impossible for it to include experts on every subject. In the case of tapes like Stargazer Secrets, the review will be written from the viewpoint of an ordinary computer owner.

Chris Somerville's letter, above, will have answered some of your questions, but we consulted him to clear up the other points, and this is what he said: "The degree of accuracy of the program depends on what time of the month your birthdate falls — if it's close to the border between two astrological signs, then three minutes might well make a difference, otherwise not. The program doesn't calculate aspects — as I said in my letter, you would need a specialised program such as Astrocalc do for that — and it uses the Equal House system of division. The screen display is pretty clear, though the printout is inevitably limited by the restrictions of the ZX Printer."

Tip tip-off

In HCW 37 you had a micro tip from Amin Hoque, giving 256 colours on the Atari.

Unfortunately, a few bugs seem to have crept in — these are the corrections, along with a slight modification to line 30 for a better display.

```
30 FOR X=0 TO 79:C=
   INT (X/2):COLOR C *
   (X/4)
100 FOR I=0 TO 15 etc.
140 COLOR 0:FOR I=0
   TO 191 STEP 12:PLOT
   0,Y:DRAWTO 79,Y.
   NEXT I
```

I. M. Levings, Sittingbourne, Kent

Keep your fingers zapping

There's a variety of aliens, vegetables and minerals to be blown to bits in these games for sharpshooters. Before you buy, read our ratings

Mission ZX Spectrum £2.95

Ian Carroll, 4 Trentbrooke Avenue, Hartlepool, Cleveland

Mission ZX is based on the arcade game Blitz, where you play the part of a bomber pilot circling above an enemy city losing both height and fuel, and where your only hope of survival is to accurately bomb the skyscrapers below before you crash into them.

Your controls only allow you to gain height once or to use hyperspace once. Other features include a limited number of missiles to clear your flight path and a facility to freeze the game temporarily.

There are three levels of play, and on the higher levels, the residents of the city lose their temper and fire back!

My two sons, aged nine and 12, and several of their friends were happily and quietly entertained for a whole afternoon with Mission ZX and for the price, that has to be good value.

Ian Carroll, who is aged 15, is hoping to make a commercial success of his programming talents. Mission ZX is a good start, and I wish him well. **D.J.**

instructions	75%
playability	75%
graphics	75%
value for money	80%

★★★★

Microbe 32K BBC £7.95

Virgin Games, 61-63 Portobello Road, London W11 3DD

Microbe is the latest release from Virgin, written by a 16 year old schoolboy, and is yet another shoot-em-up arcade game for BBC owners.

In this particular version, the scenario is inside an alien's body, using a 'microbe' to kill off the organisms within.

Among the enemies to be dealt with are blue cells, antibodies, aminos, ribosomes, red cells and spores. Each has a slightly different form of attack and movement, and very quick reactions are needed.

One difference is that your base can be moved up and down the screen as well as the conventional left-right.

Graphics and speed of animation were very impressive, although the game tended to slow down noticeably when lots of things were on the screen at the same time.

Sound was used very well, and all in all it was a very fast and enjoyable game.

However, after you have reached the most complicated screen, the game switches straight back to the beginning. The keyboard controls are difficult to master, and some joystick facility would be an improvement. **D.A.**

instructions	69%
playability	79%
graphics	89%
value for money	85%

★★★★

Chieftan 32K BBC plus joysticks £7.95

Virgin Games, 61/63 Portobello Road, London W11 3DD

Chieftan is a tank battle game for one or two players. Using joysticks you have to manoeuvre your tank around the battlefield destroying trees and chalets to score points, the ultimate aim being to destroy the enemy tanks.

It all sounds very exciting, but I'm afraid I didn't find it so.

On opening the cassette case and removing the insert I discovered the game was for joysticks only, this should be prominent on the outside of the cassette to avoid wasted purchases.

The insert also gives further brief instructions and a screen photograph of the 'action'.

The screen display features trees, mountains, chalets, lakes and a time-shift tunnel, but is unimaginative. Character graphics are employed with no use of multi-coloured shapes.

The 'tanks' only appear as either blue or red rectangles with a protrusion representing the gun. The whole program is written in BASIC and consequently the action is jerky and fairly slow — certainly not up to the standard we have come to expect for the Beeb.

With all the hullabaloo surrounding the launch of Virgin Games, I would have expected something better than this. **D.H.**

instructions	
playability	60%
graphics	60%
value for money	40%
	30%

★★

Who Dares... Commodore 64 plus joystick £5.95

dk'tronics, 23 Sussex Road, Gorleston, Great Yarmouth, Norfolk

I had a lot of trouble loading this game. In all I managed to load it three times out of twelve attempts. However, once loaded, it behaved perfectly.

The setting for this game is a house containing terrorists and hostages. Your task is to shoot the terrorists when they appear in any of the windows.

If you shoot a hostage by mistake, you are demoted. The game ends when you either run out of time or you are demoted to civilian status.

Basically you are firing against the clock. After every six shots you have to move back to the arms depot to reload. I found I was wasting time there as in my rush to reload I had difficulty in positioning my joystick accurately.

The other little snag is that the terrorists and hostages periodically change colour. A box at the top of the screen tells you the current terrorist colour — if you don't keep your eye on it, you could find yourself shooting the hostages.

Maybe I'm blood thirsty, but I quite enjoyed this game. **L.C.**

instructions	
playability	70%
graphics	70%
value for money	60%
	70%

★★★★

Up Periscope TI-99/4A (Extended BASIC) £7

By Pewterware, from Stainless Software, 10 Alstone Road, Stockport

This is another in the series of the "chase 'em and kill 'em" type games. The aim is to track and destroy as much enemy shipping as possible with your torpedoes.

Three levels of difficulty are offered. Normal, Difficult, and Impossible. You select a torpedo load — either 12 or 24 — and away you go.

All the instructions are given in separate documentation, and the game is quite involved, albeit slow.

The screen display gives a periscope display of two vessels, one a target, the other an escort.

I tried for some time without success to destroy even one ship, perhaps my heart wasn't in it.

The enemy shipping can drop depth charges on you, although I never got close enough to incur their displeasure.

You control your speed, depth, and course heading, and can lower or raise your periscope, switching between two different displays as you do so.

One gives you an echo scan of the vessels which you are to sink, while the other gives a duck's-eye view of them as they sit, ripe for sinking.

All in all, I found the game slow and ultimately boring. **P.B.**

	90%
instructions	40%
playability	60%
graphics	40%
value for money	

★★

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How to use the guide

How to use the guide

Price: This is the recommended price. It is often possible to find a lower price by shopping around. The guide is in price order, where possible.

Memory is given next. First is the total random access memory, followed by the amount you can actually use for your programs after the computer has taken what it needs. Then there is the size of the read-only memory which can be used but not changed. The size is a fair indication of the complexity of the built-in language.

Keyboard: If you are a typist you may feel you need a typewriter style keyboard which puts up the price of the computer. Many of the popular computers have button-like keys each of which performs several duties.

Screen: The number of columns or characters per line and number of lines of text on the screen, followed by high-resolution modes in which images can be designed by programming. Colours and other screen features are also given.

Sound: the music and sound effects the computer can make.

Languages: most micros have BASIC built in, and others available at extra cost. Microsoft BASIC is the most popular and if you know this you can switch fairly easily to another computer using it. But this does not mean programs will run unchanged on different computers. Except in rare cases they will not.

Processor: One of the most important things in a computer. The most popular are 6502A/6510 and the Z80 and Z80A. The 6502 is probably the best and fastest, although this depends on the application.

Operating system: Used by the computer as a common core to control itself and what your software asks of it. Most are machine-specific. Similar operating systems make it easy for programmers to convert software.

I/O stands for input/output – the sockets through which the computer communicates with the outside world. All computers can interface to cassette recorders, so this is not mentioned. Sockets for domestic TVs are not given for the same reason. RS-232 and Centronics are the industry-standard interfaces for a wide range of printers.

Number sold in U.K is an estimate from the maker.

Speed: a general indication only. The faster the better.

Add-ons: a guide to the devices you can plug into the computer, from extra memory to sophisticated printers. The computer magazines are packed with advertisements from makers of add-ons. Study them if you want to extend the computer past what it was intended for.

Software, after price and memory, is probably the major factor in choosing a computer. The difficulty is that the newer, more sophisticated computers generally have less software available. After all, independent software houses are inclined to produce programs for micros which have sold in their thousands. In many cases, however, micro makers commission software for new launches.

Opinion is mine alone. Do decide why you want a computer before going into the shop and then ensure you get a demonstration. Members of your local computer club (details at libraries) will also be glad to help.

• This guide covers popular home computers costing less than £400 which are on sale now. It has been updated since it last appeared in our November 8 issue. Please send any future amendments to Micro Guide, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. After December 19 our address will be 1 Golden Square, London W1R 3AB

The computers in alphabetical order

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Genie I 48K	£365.70
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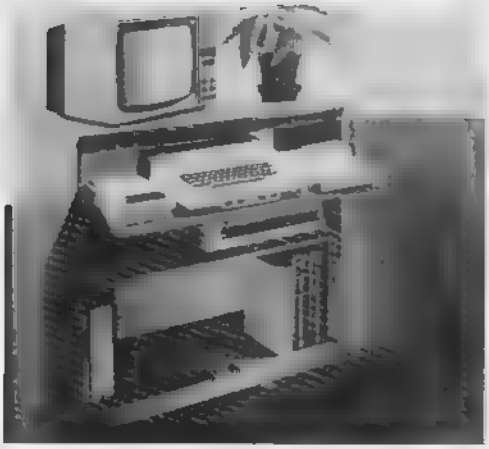

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At this age less parental help and guidance are necessary Your child will continually be seeking new experiences and will enjoy his/her mind being challenged Clever Clogs satisfies both criteria

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HCW 12/83

ZX81 — £39.95

1K RAM (0.3K useable) 8K ROM

Keyboard: flat membrane-type, 40 keys, no space bar or special function keys or dedicated cursor control keys, five functions per key
Screen: 32 columns by 22 rows, only 20 rows useable Black and white display, no hi-res or colour but 64 by 40 plotting of points is supported. Display is reverse of most, i.e letters are black on white
Sound: none.
Languages: BASIC, very crude and very non-standard. **Processor:** Z80A. **Operating system:** Sinclair. **I/O:** none included but can be added via an expansion port ZX Printer requires no interface **Number sold in UK:** 500,000.
Add-Ons: A 16K RAM pack is available at £29 95. A printer that works by spark erasure on metallised paper 4½ in wide costs £39.95, but this is only really useful as a cheap means of listing a program.
Add-ons: Interfaces are available for almost every application, due to the large amount of users. This also applies to other add-ons, such as better keyboards, RAM packs and joysticks.
Software: likewise available in great quantity and for the same reasons although little is produced now because the ZX81 has been overtaken for most purposes by the new generation of colour computers. A starter pack of ZX81 and 16K RAM pack costs £49 from W.H. Smith.
Opinion: An old design at a low price. The keyboard is very hard to use and soon wears out, although extension keyboards can be added. Screen display quality is poor and tiring to look at for any length of time. Editing is very minimal. All inputs, whatever they are, must be on the bottom line. Key words must be entered with assigned keys. The ZX81 is useful as an introduction to computing and even then it is hard to move on as the BASIC is so non-standard. It is compatible with a small sub-set of the Spectrum's more basic features. The ZX81 has two speeds of operation: very slow and slower still.
Sinclair Research: Stanhope Road, Camberley, Surrey GU15 3BR
Camberley (0276) 685511

Aquarius — £59.95

4K RAM (1.7K useable) 8K ROM

Keyboard: hard rubber mat type similar to but slightly worse than the Spectrum's. 49 keys, no user definable keys, no dedicated cursor control keys, no space bar.
Screen: 40 columns by 24 rows text with 16 colours. No hi-res graphics or definable characters, but hi-res is claimed with expansion although no details of this are available.
Sound: single channel sound generator.
Languages: Microsoft BASIC included. No editor, making changes to programs cumbersome. LOGO and Extended BASIC planned. **Processor:** Z80A. **Operating System:** custom. **I/O:** none included except cartridge port and expansion bus **Number sold in UK:** new machine so no figures yet available. **Speed:** medium.
Add-ons: mini expansion box gives two extra channels for sound generation, two cartridge slots. RAMpacks are £30 for 4K and £40 for 16K. Joy pads are available which are similar to Mattel's Intellivision joy pads. A cassette recorder is an option but a normal cassette recorder can be used although Mattel say there have been problems and recommend their own recorder. A 40-column thermal printer can be attached without extra interfaces. A modem and a maxi expander are planned Since this is a fairly new computer there is nothing forthcoming from independant supphers.
Software: available from Mattel. About 15 cartridges Three games tapes from Apocalypse, of Abingdon, with more promised. No others known from independents.
Opinion: this computer appears to be a sort of colour ZX81 but it has quite a lot of other capabilities. The big problem is its lack of memory. Even so a lot can be done with this amount and it does have the advantage of a cartridge slot, sound of a sort and colour graphics.
Mattel, North End Road, Wembley, Middx HA9 0AB 01-900 0311

Laser 200 — £69.95

4K RAM 16K ROM

Keyboard: 45 keys, hard rubber mat type, better than Spectrum and more widely spaced. Up to four functions per key.
Screen: 32 columns by 16 rows or 128 by 64 in graphics mode, 96 characters Eight foreground colours in text mode, four colours for graphics
Sound: single channel
Languages: BASIC, with optional single key entry built

BBC Microcomputer System

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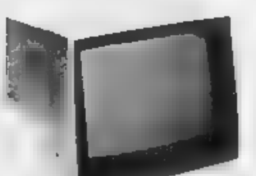

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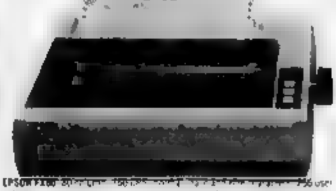

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TEXAS INSTRUMENTS TI 99/4A

This microcomputer is based on TMS9900 16-bit microprocessor. It includes 16K RAM 16 colour high resolution graphic (192 x 256). The screen display is 32 characters 24 lines TI-BASIC. Full-size keyboard. For Software there are about 1000 programs to choose from. There are a lot of peripherals available e.g. Disk Drives Disk Interface Speech Synthesizer Extra RAM Additional language (PASCAL, TI LOGO, ASSEMBLER)

TI HOME COMPUTER HARDWARE

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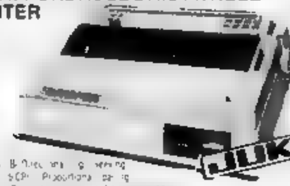

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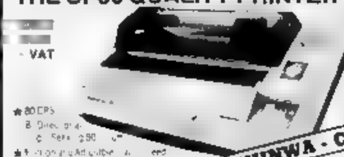

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in,more promised. **Processor:** Z80A. **Operating system:** custom. **I/O:** Centronics port for printers etc and expansion slot. **Number sold in UK:** no figure available — computer was launched in July

Software: 15 titles available from distributors with more promised. Distributor says three software houses are writing for the Laser.

Add-ons: 16K RAM pack available now. Promised soon: 64K RAM pack, joysticks, light pen, RS232 interface, four-colour printer/plotter.

Opinion: Aimed squarely at first-timers, the Laser 200 is easy to use for beginners. However, the 16K RAM pack costs about £30, taking it into the hotly-contested Spectrum/Oric bracket Screen resolution is limited and so is the colour display. Stylish appearance. The Laser 200 is made in Hong Kong and known in the US as the VZ200

Computers for All, Southfields Industrial Park, 30 Hornsby Square, Laindon, Essex.
Basildon (0268) 418414

Jupiter Ace — £89.95

19K RAM (17K useable) 8K ROM

Keyboard: rubber mat similar to Spectrum, 40 keys, no space bar or special function keys or dedicated cursor control keys. Three functions per key.

Screen: 32 columns by 24 rows, black and white display, all characters are user definable, no hi-res or colour but block graphics are included.

Sound: internal beeper.

Languages: Forth is standard. **Processor:** Z80A **Operating system:** custom. **I/O:** none included but can be added via expansion port.

Add-Ons: 48K RAM pack is £79.95. Printer interfaces etc. are available from independent manufacturers. One enables Sinclair's ZX Printer to be used. BASIC and disc drives are under development although nothing is known about these except that the discs are of the three inch real disc type (none of your continuous loop tapes here) and a full disc system will cost around £300. **Number sold in UK:** 5,000. **Speed:** fast.

Software: available in limited quantity.

Opinion: WARNING — Jupiter Cantab, maker of the Ace, is now in the hands of a liquidator who is seeking a buyer. Aces are, however, still on sale and there are more in the company's warehouses. So the following comment still applies: a good computer that suffers by having a language that differs from most others. The manual is clear and concise and will explain most of the oddities of Forth. The program editor is unusual because it is orientated towards the editing of Forth words, which is good for this kind of application but may confuse some people. Fast speed is mainly due to the language the computer uses. The Ace would be useful for people who want an introduction to Forth, a fast computer or simply want to be different.

The liquidator is Dennis Cross, **Chater and Myhill,** Sussex House, Hobson Street, Cambridge CB1 1NJ
Cambridge (0223) 66692

Oric 16K — £99.95

16K RAM (14K useable in text mode, 7.5K in graphics mode) 16K ROM

Keyboard: raised key, similar to calculator type but better, 57 keys, space bar, dedicated cursor control keys, no definable function keys, two functions per key.
Screen: 40 columns by 28 rows, Teletext compatible text display, two user definable character sets, eight foreground and eight background colours, double height, flashing, and inverted attributes available for each character. Graphics screen gives 240 by 200 resolution, colours and attributes are definable on a grid of 40 by 200. In each of these areas the foreground and background can be defined in eight colours, flashing and inverted output is also supported. In graphics mode three lines at the bottom of the screen also appear, and these are the same as the text mode lines
Sound: sound generator with three channels and noise generator. There is a certain amount of envelope control. Pre-programmed sounds produce pings and zaps etc. Sound is produced through an internal speaker although hi-fi output is available through a DIN socket
Languages: Extended Microsoft BASIC built in. Forth available, BBC-like BASIC planned. **Processor:** 6502A. **Operating System:** custom. **I/O:** Centronics parallel printer port, user port, monitor port, expansion connector. **Number sold in UK:** 100,000. **Speed:** fast.
Add-Ons: from Oric, a four colour printer/plotter using 4½ in paper to give very good quality output up to 80 columns. A communications modem and three-inch disc drives are to be available soon. Joystick interfaces and other such items are available from independant suppliers.
Software: quite a lot, more appearing every day.
Opinion: This computer has always been compared to the Spectrum, and this is justified as they are outwardly similar and prices are the same. Looking at the two computers though, the Oric wins. The BASIC is easier and is a structured form of the de-facto standard Microsoft BASIC. The keyboard is better, the graphics are better, it has real sound which is lacking in the Sinclair machine. Interfaces are built in that would normally cost extra. The edge that the Spectrum has is more software.See also 48K Oric (£139.95).
Oric Products International, Coworth Park, London Road, Ascot, Berks SL5 7SE
Ascot (0990) 27686

Spectrum 16K — £99.95

16K RAM (7.5K useable) 16K ROM

Keyboard: rubber mat type, 40 keys, no space bar, definable function keys or dedicated cursor control keys, five or six functions per key

Screen: 32 columns by 24 rows, but only 22 rows are available to the user. 256 by 176 high-resolution graphics supported by BASIC, two colours from a palette of eight are available in 704 areas on the screen. Foreground and background colours for each of these areas can be selected as well as whether the contents of the area are flashing or not. Two levels of intensity are also supported. 21 user defined characters are available.

Sound: internal beeper.

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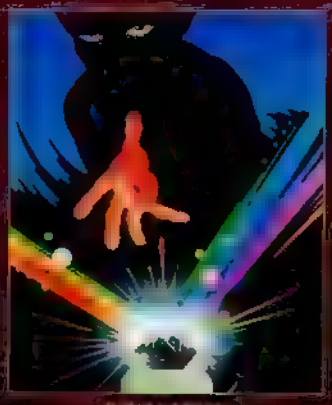

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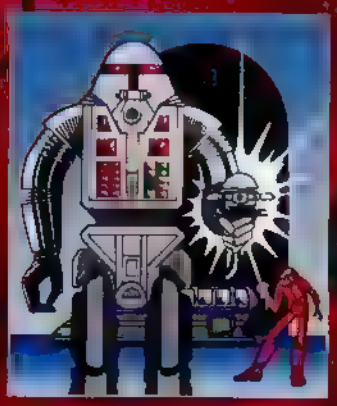

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THE CRYPT

written by Stephen Renton

Prepare yourself for the many challenges that shall confront you when you dare to enter "THE CRYPT".

You will battle with giant scorpions, Hell spawn, Craners, Pac-Nags and if you are unlucky enough — the Dark Cyclops in this arcade style adventure.

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THE DEVIL [illegible]

I uttered the last incantations as the clock struck thirteen. All fell silent except for a faint rustling in the corner. From out of the shadows they came, all Hell's fury against me but I was not defenceless until the Angel Of Death, astride a winged horse, joined the battle. Avoiding his bolts of hell fire, I took careful aim. My chances were slim, but if my luck held . . . 48K Spectrum £5.95.

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"The Wrath Of Magra" comes as three, 48K programs on cassette, boxed with instruction manual and book detailing the history of the Third Continent and the many spells you will be using throughout the game.

NOTE: "The Wrath Of Magra" is a complete adventure. You need not buy "Volcanic Dungeon" or "Black Crystal" to play it.

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Carnell Software Ltd, North Weylands Industrial Estate, Molesey Road, Hersham, Surrey KT12 3PL.
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CARNELL SOFTWARE LTD

Languages: Sinclair BASIC. This version is an extended form of the type used in the ZX81. The extensions do not cover structured programming or aid functions, and only deal with the graphics and file handling. This BASIC is very non-standard. **Processor:** Z80A. **Operating System:** Sinclair. **I/O:** none included but the ZX printer can be added without an interface. **Number sold in UK:** 400,000. **Speed:** medium.

Add-Ons: ZX Printer (see ZX81 for description). Microdrives, fast continuous loop tape recorders costing £49.95, need the ZX Interface to be attached This costs £29.95 when purchased with a Microdrive or £49.95 when bought separately. The interface also provides a printer interface and a networking system. ZX Interface gives two Atari-type joystick ports and a slot for ROM games cartridges. This costs £19 95 with 10 cartridges at present available at £14.95 each. Many other add-ons are available from independant suppliers.

Software: a lot of software is available for almost all applications, particularly games. Despite the business software available, the Spectrum cannot realistically be considered as a business machine.

Opinion: reckoned to be Britain's best-selling computer, when the Spectrum first appeared it was quite an innovation as the lowest priced colour micro. But newer designs have arrived recently with better technical specifications and more useable memory at similar prices. The colour display is not good and a colour display cannot be produced on a few colour TVs. For editing and the method of keyword entry see ZX81. With the Spectrum there are more keywords to be fitted on the same size of keyboard. Sound is through a beeper only. The range of software available is enormous. See also Spectrum 48K (£129.95).

Sinclair Research, Stanhope Road, Camberley, Surrey GU15 3PS
Camberley (0276) 685311

Tandy MC-10 — £99.95

4K RAM 8K ROM

Keyboard: 47 hard plastic keys in Spectrum-style layout, includes 16 graphics keys, space bar. Single key keyword entry.
Screen: 32 columns by 16 lines text, 64 by 32 graphics. Eight colours.
Sound: single channel, five octaves controlled from BASIC.
Languages: Microsoft BASIC. **Processor:** 6803 **Operating system:** Microsoft. **I/O:** RS-232. **Number sold in UK:** no comment from Tandy, but small because computer launched recently. **Speed:** medium to fast.
Add-ons: 16K RAM pack. Compatible with most Tandy printers.
Software: small range.
Opinion: Tandy is selling this computer through 220 of its stores, rising to around 300, so support is good. It has been on sale in the US since May, so imported software from independents is likely. No UK independent software is known.
Tandy, Tameway Tower, Bridge Street, Walsall, West Midlands WS1 1LA
0922 648181

TI-99/4A — £99.95

16K RAM (14.5K useable) 26K ROM

Keyboard: typewriter style, 48 keys, space bar. Two functions per key.
Screen: 32 columns by 24 rows text, 128 characters, all user-definable, 16 colours each for foreground and background. The way colour is handled is rather odd — a colour is assigned to a particular group of characters There are 16 groups of eight characters, so a particular colour can be assigned, for example, to the letter A but will also affect B to H High-resolution graphics only available with TI plug-in cartridges.
Sound: three channels of five octaves with noise channel
Languages: TI BASIC is included, but cannot use machine code, so arcade quality programs cannot be written or bought on cassette for the standard model. To write or use machine code programs, TI's Mini Memory or Editor Assembler cartridges are needed. Machine code can also be used with Extended BASIC, provided 32K is added. LOGO, the teaching language, is also available. **Processor:** TMS 9900. **Operating system:** custom. **I/O:** joystick and cartridge ports. **Number sold in UK:** TI would not comment, our estimate: 50,000 **Speed:** slow.
Add-ons: Most come from Texas Instruments and, apart from joysticks and speech synthesiser, all TI's products need a peripheral expansion box. Available: disc drives, 32K RAM card, RS-232 serial port for printers. TI's own cassette recorder includes a cable; your own will need a special cable. Among the very few independent add-ons is a 32K RAMpack from Arcade, of Manchester, which does not require the expansion module
Software: More software was becoming available — including US imports — but you may be forced to buy through mail order. TI sells a range of sophisticated cartridge software which is more expensive.
Opinion: IMPORTANT NOTE — Texas Instruments stopped making the TI-99/4A last month after losing money heavily. Now it will manufacture only business micros. TI has promised, however, that it will continue to support the 99/4A. UK companies Arcade, Stainless Software, of Stockport, and Christine Computing, of Watford, have also promised continuing software/add-ons, including imports. The computer is now to be sold at cut prices by dealers to clear remaining stocks. My comment still applies: an interesting computer which is quite good value, even at the pre-announcement price of £99.95. And it looks like a real computer with its good keyboard. Its drawback is that machine code cannot be used with the standard model so there is not much arcade-type cassette software, although this is slowly increasing. However, if all the games that interest you are from TI and you are willing to pay cartridge prices, then this is a good machine. For programmers it has a line editor which, although one of the better versions, is awkward to use. The BASIC is slow but easy to use and comprehensive. Its worst features are that there can be

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just one statement per line and spaces are essential Maths functions are good but string functions leave something to be desired. The computer is very well built and looks attractive
Texas Instruments, Manton Lane, Bedford MK41 7PA
Bedford (0234) 67466

VIC-20 — £99.95

5K RAM (3 5K useable) 20K ROM

Keyboard: typewriter quality, 67 keys, space bar, dedicated cursor controls, four user definable function keys
Screen: 22 columns by 23 lines, eight colours for text, 16 for background and border and graphics. All characters user definable, lower case, inverted output, two character sets. High-resolution possible with expansion cartridge or with extra programming but BASIC does not support this Two modes, 160 by 128 in eight colours and 80 by 128 in 16 colours — more with expansion.
Sound: three channels and one noise channel covering nine octaves through TV speaker
Language: Commodore BASIC supplied, compatible with PET and Commodore 64, Extended BASIC, at extra cost gives access to the hi-res, sound, and user definable function keys. Forth, Comal and Pilot are available **Processor:** 6502A **Operating System:** Commodore Kernal. **I/O:** IEEE 488 serial bus, RS232, user port, cartridge port, joystick port, two paddle port (two analogue to digital converters). **Number sold in UK:** 500,000
Speed: medium to fast.
Add-ons: lots available due to its immense popularity From Commodore alone there are printers, plotters, disc drives, modems and, via an IEEE 488 parallel cartridge, access to Commodore Hewlett Packard and laboratory instruments. Disc drives from floppies to a hard disc Winchester holding 32 megabytes. Commodore's own cassette recorder (about £44 95) is essential. Memory expansion up to 24K is available, starting with a 3K RAMpack
Software: Many cassette tapes and cartridges from independents and Commodore.
Opinion: this is a nice machine with which to get started and it is also available in a package, costing £139 95, containing a VIC-20, cassette recorder, beginners' guide to BASIC and a games tape In this way the initial high price for a 3.5K computer is somewhat offset If you buy the computer alone, remember that Commodore's own cassette recorder (about £44 95) is essential The Basic is very easy to learn and is Microsoft compatible. This type of BASIC was first used by Commodore on the first widely available micro in 1977 so there is a lot of compatible software around
Commodore Business Machines, 675 Ajax Avenue, Slough, Berks SL1 4BG
Slough (75) 79292/74111

Spectrum 48K — £129.95

48K RAM (39 5K useable) 16K ROM

Identical to 16K version in every respect except price and memory and the fact that more software is available due to increased memory size
Sinclair Research, Camberley, Surrey GU15 3BR
Camberley (0276) 685311

Oric 48K — £139.95

64K RAM (46K useable in text mode, 39.5K free in graphics mode) 16K ROM

Identical to the 16K version (£99 95) except for the memory differences and certain control lines on the expansion port to allow the ROM to be switched out and the extra memory to be accessed.
Oric Products International, Coworth Park, London Road, Ascot, Berks SL5 7SE
Ascot (0990) 27686

Sord M5 — £149.95

20K RAM (4K useable) 8K ROM

Keyboard: hard rubber mat, 55 keys, no space bar, no dedicated cursor control keys or user definable keys Optional single key word entry from keyboard
Screen: with the BASIC I cartridge (supplied) — 40 by 24 text monotone, 32 by 24 with one each of 16 colours per pixel, 64 by 48 with one each of 16 colours per pixel and a high-resolution mode of 256 by 192, 16 colours. 768 user-definable characters and 32 sprites, selected from 256 user-definable characters, of up to 16 colours each. Two screens can be called from programs.
Sound: three channel sound generator with one noise generator. Sound covers eight octaves
Languages: BASIC I, included, is non-standard and has integer only arithmetic and not much in the way of graphics commands BASIC G, available at extra cost, makes use of graphics described above, but also has integer-only arithmetic. BASIC F allows floating point maths and is designed for mathematical and scientific programming. **Processor:** Z80A. **Operating system:** custom. **I/O:** Centronics parallel printer port, two joypad ports, cartridge slot. Cartridge slot cannot be used at the same time as BASIC because the BASIC is on a cartridge and thus occupies the port. **Number sold in UK:** no figures available – this is a new release.
Add-Ons: 32K RAM pack, printers, joy pads and an expansion box with three cartridge slots are available. An acoustic coupler to allow data transmission by phone is promised. As the M5 is new to the UK, no independent add-ons are known.
Software: A lot of cartridges from Sord, including a Visi-Calc lookalike and the other BASICs described above. None available from independent suppliers.
Opinion: Availability of sprites is good, but the M5's BASIC has shortcomings and there is little memory for the price Other computers offer a lot more for less. The M5 is also known as the CGL M5, after the UK distributors, Computer Games Ltd, Goldings Hill, Loughton, Essex IG10 2RR (01-508 5600).
Sord Computer Systems, Samuel House, 6 St Albans Street, Haymarket, London SW1Y 4SQ 01-930 4214

Atari 400 — £149.99

16K RAM (amount useable depends on graphics mode) 16K ROM

Now succeeded by the 600XL (£160) which is software compatible, the 400 cannot be officially extended above 16K and has only one cartridge slot, usually occupied by the BASIC cartridge (built-in on the 600XL) or for cartridge software. "Sculptured" membrane keyboard in

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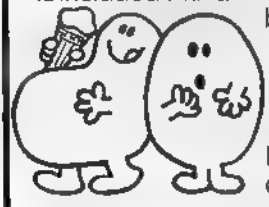

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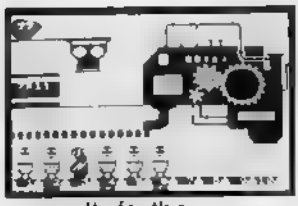

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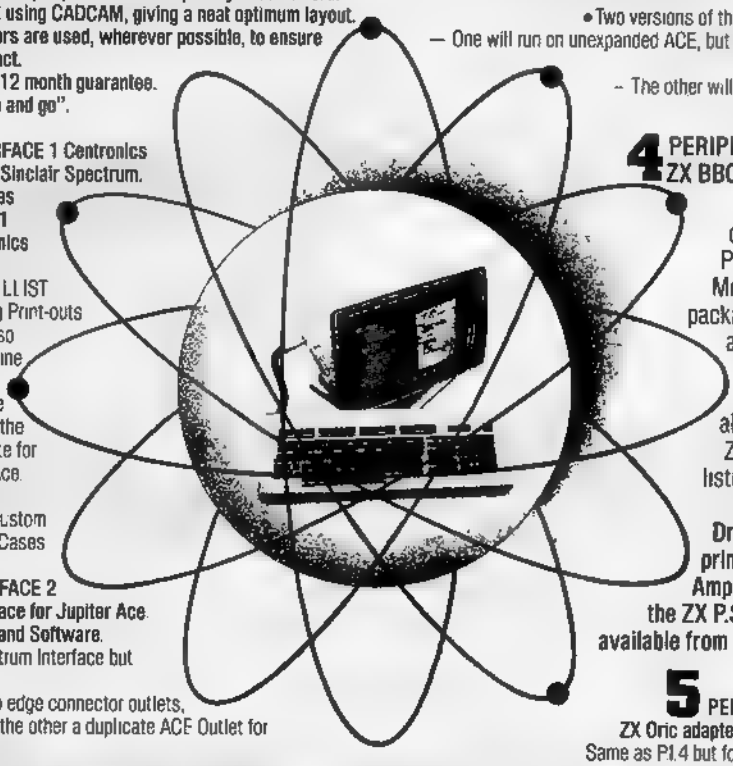

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typewriter layout Has 11 screen modes instead of the new model's 16 and sound is handled slightly differently.
Opinion: Atari BASIC is easy to use (see 600XL, £160) although the 400 has a rather dated appearance in comparison with the new model. Keyboard is better than the ZX81 type of flat membrane because the surface is contoured to form a ridge around each key area and a beep sounds every time you press a key-to reassure you that the keypress has been accepted. See also the similar Atari 800 (£299 99)
Atari, Railway Terrace, Slough, Berks SL2 5BZ
Slough (75) 33344

Atari 600XL — £160

16K RAM (amount useable varies with graphics mode used) 26K ROM

Keyboard: Full typewriter style keyboard, 58 keys, four function keys, space bar but no dedicated cursor control keys.
Screen: 16 screen modes comprising five text modes and 11 graphics modes. Text is 40 columns by 24 lines in up to 256 colours. The graphics have a maximum resolution of 320 by 192 in the maximum hi-res mode. All characters are user definable and come in predefined shapes to start with. Player-missile graphics — like sprites — are also available.

Sound: four channel sound generator with full software support.

Languages: Atari BASIC included and these are available: Forth, Pilot, Logo, WSSM, Pascal, Microsoft BASIC Two types of assembler editor are also available. **Processor:** 6502A. **Operating System:** Atari OS. **I/O:** serial input/output port, along with two connectors for two joysticks or four paddles. Other interfaces may be added via interface bus. Slot for ROM cartridges. Cassette port will only allow connection of Atari cassette recorder at £49 99, so this must be taken into account when considering costs. **Number sold in UK:** Atari would not comment. **Speed:** medium to fast. **Software:** the XL series is software compatible with older models so a lot of software is on sale both from Atari — which has a library of 500 titles — and from independents, including US imports

Add-Ons: Atari's essential cassette recorder uses one track for computer data and the other for audio that can be made to play under program control for purposes such as language tuition. Joysticks, paddles, and light pens are available from Atari. A disc system using a custom DOS. A CP/M cartridge, a printer plotter, a printer with a typeface like a daisy wheel but using a new system and a graphics tablet are due soon.

Opinion: The best of both worlds — a new design which can run the software for the older range. Excellent graphics and much of the software uses this to the full. Can be used by small businesses and the software for this is available Writing your own programs is made easier by the full screen editor with all insert, delete and other functions easily accessible. Second only to the Commodore system for this. See also Atari 400 (£149.99) and 800 (£299.99). The Atari 800XL is due early next year.

Atari, Railway Terrace, Slough, Berks SL2 5BZ
Slough (75) 33344

Colour Genie — £168

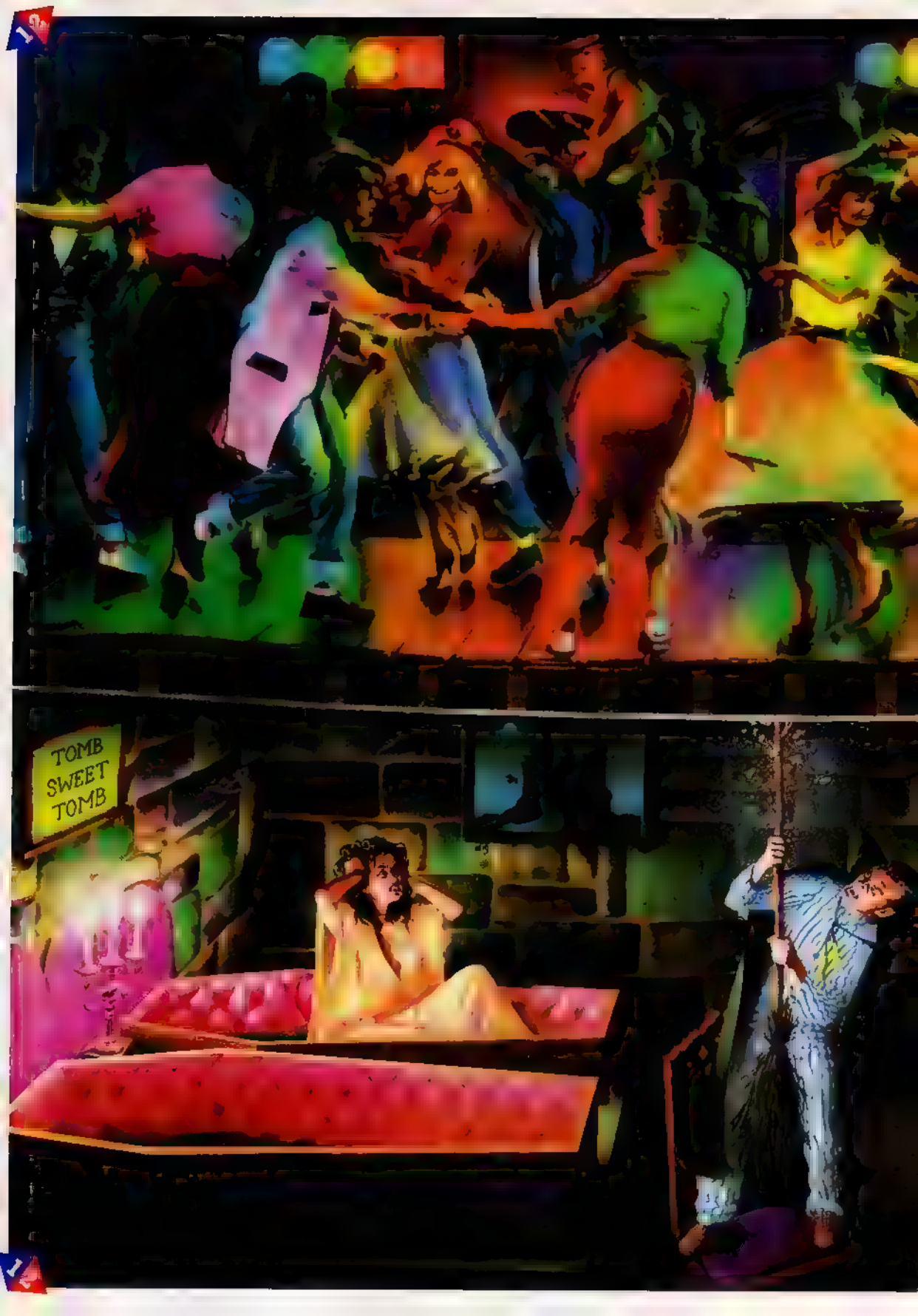
32K RAM (30K text mode, 26K hi-res mode useable) 16K ROM

Keyboard: typewriter style, 63 keys, space bar, dedicated cursor control keys, four user definable function keys, full BASIC support for eight with shifts.
Screen: text mode - 40 columns by 25 rows of text with 16 colours, 128 characters user definable. Graphics mode — 160 by 102 hi-res in four colours with one background colour. The BASIC supports the graphics with commands to do almost anything and is very comprehensive.
Sound: three channels, each capable of noise production, eight octaves, no envelope control
Languages: Microsoft Extended BASIC included, Forth available. **Processor:** Z80. **Operating system:** custom. **I/O:** two parallel ports, RS232 serial port, cartridge port, joystick port. **Number sold in UK:** not available. Not that many but number growing all the time. **Speed:** slow to medium.
Add-Ons: from Lowe Computers — Centronics parallel printer interface, joysticks, printers, modem, disc drives. Not a lot from independent suppliers.
Software: About 60. Some converted from compatible TRS-80 and Genie I
Opinion: at first the Colour Genie suffered from too high a price and too small a memory. But now memory has been increased and the price cut looks like taking off. The BASIC is a good implementation and has all the necessary things plus some nice additions. Interest is now growing steadily, although whether it will be able to stop the assault by new machines such as the Electron is questionable as it does not have the backing of lots of independent software to keep it afloat. A shame, as this is a good computer worthy of more attention.
Lowe Computers, Chesterfield Road, Matlock, Derbyshire DE4 5LE
Matlock (0629) 4057/4995

Dragon 32 — £175

32K RAM (30K to 24K RAM useable depending upon graphics mode used) 16K ROM

Keyboard: 52 key typewriter style, space bar, no user definable function keys or dedicated cursor control keys Keyboard quality could be improved
Screen: text mode 32 columns by 16 rows, text in one colour, no lower case or user definable graphics or colour, but there is an inverted output option. Text mode does have block graphics in colour though. Graphics mode ranges from 256 by 192 in one colour to 128 by 192 in four colours. Text is not supported in these modes.
Sound: one channel music generator covering five octaves, good software control.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2 **Tomb Of Dracula** Darkness is falling. The vampires are hungry. .You can't go back.. Your only chance of survival lies ahead.
The walls are cold and clammy. With each step you remember the horrors ahead, ghouls, zombies and pits of choking slime. In your hand you have but seven silver stakes with which to defend yourself. .Dare you face the ultimate evil.. .and win.

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This is it, the ultimate Fruit Machine for the VIC with nudge, hold and respin 100% machine code. "Overall Jackpot is a beautifully written simulation giving superb graphics, animation and use of colour. In fact, this program makes Commodore's Fruit Machine cartridge look unbelievably cheap and nasty." Home Computing Weekly No. 20 19/7/83..... **£5.50**

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Accuracy and speed are required for this Shooting Gallery, superb use of colour and graphics in this new and challenging game from the author of Jackpot. 100% machine code, joystick or keyboard control..... **£5.50**

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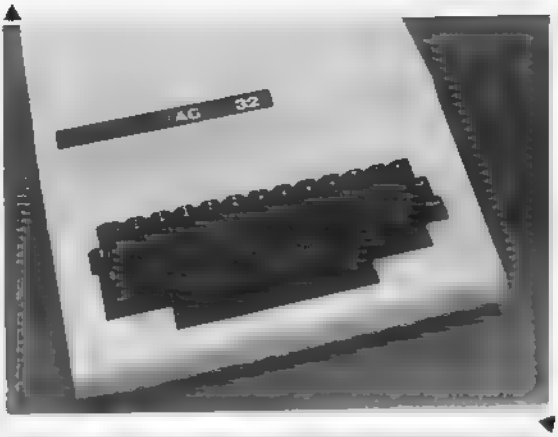
Languages: Microsoft Extended Colour BASIC included Identical to Tandy colour computer BASIC. Other languages from independents. **Processor:** 6809E **Operating System:** Microsoft's own, modified by Dragon, compatible with the Tandy. OS/09 is to become available when Dragon release discs. **I/O:** User port, Centronics parallel printer port, two joystick ports, cartridge port. **Number sold in UK:** 100,000
Add-Ons: joysticks and disc drives from Dragon. Lots available from independents, ranging from printers to disc drives. Most Tandy suppliers have peripherals that will fit Dragon, likewise Tandy software But software has only a certain amount of compatibility and it is wise to check.
Software: quite a lot available from Dragon and independents and (but check) Tandy
Opinion: this micro is limited by its very basic sound system and its horrible text mode with very limiting formats. The BASIC is very good at manipulating screen graphics although it does not allow structuring. An altogether much better buy than the Tandy computer to which it is so similar because it already has much of the expansion that comes at extra cost for the Tandy machine and at a price that is lower than the basic initial price of the Tandy machine.
Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan SA13 2PE
Kenfig Hill (0656) 744700



TRS-80 Colour — £179.95

16K RAM 8K ROM

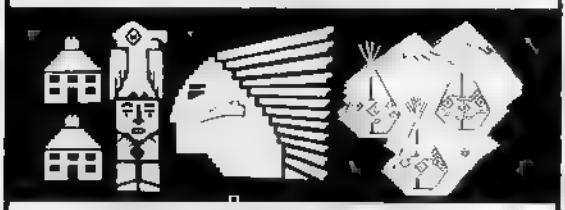
Keyboard: calculator type, 53 keys, space bar, no dedicated cursor control keys or user definable function keys
Screen: 32 columns by 16 rows in two colours for text and eight colours for block graphics. No user definable graphics. Hi-res graphics are only available with Extended BASIC at extra cost.
Sound: one channel covering eight octaves. For full control over sound Extended BASIC is needed.
Languages: Microsoft BASIC built in but Extended Microsoft Colour BASIC is available and this is really needed to make the full use of the machines capabilities OS/09 is available for use with discs giving access to many other languages in the same way as CP/M but in a smaller way **Operating system:** Microsoft's own, but compatible with Dragon 32. OS/09 available for discs. **Processor:** 6809E. **I/O:** Centronics printer port, two joystick ports, cartridge slot. **Number sold in UK:** Tandy refused to comment on number sold. **Speed:** medium.
Add-ons: from Tandy there are printers, plotters, an RS232C cartridge and disc drives. Joysticks at £9.95 a pair, upgrade to 32K RAM is £79 95 and Extended Colour BASIC upgrade kit is £59 95 (both exclude installation). The arrival of the Dragon, which is similar, means there is little from independents.
Software: a range from Tandy stores, plus independents who also write for the Dragon.
Opinion: when expanded, at a total cost of £140, Tandy's Colour Computer is virtually the same as the 32K Dragon — even at Tandy's new lower price. The Dragon has real typewriter-style keys, Extended BASIC, twice the memory of this model and is £5 cheaper than the cheapest Colour Computer. So if you are considering buying this computer, then buy the Dragon instead. Otherwise my opinion is the same as for the Dragon as the computers are so similar. See also TRS-80 Colour Computer 32K (£219.95) and TRS-80 Colour Computer 32K Extended BASIC (£299.95).
Tandy, Tameway Tower, Bridge Street, Walsall WS1 1LA
Walsall (0922) 648181

Spectravideo SV 318 — £198.95

32K RAM (16K useable) 32K ROM

Keyboard: 72 rubber keys in typewriter layout, plus built-in joystick
Screen: 40 columns by 24 rows text and 256 by 192 in hi-res mode, 16 colours and 32 sprites
Sound: three channels, eight octaves, through external speaker, including TV, only
Languages: The first computer in the UK to use MSX BASIC which is being promoted by several major manufacturers as a standard. Plus Extended Microsoft BASIC. **Operating system:** MSX. **Processor:** Z80 **I/O:** two joystick ports, Centronics interface, expansion port. **Number sold in UK:** computer just launched, supplies limited
Add-Ons: all the following available now, says importer — joysticks, single and multi expansion units, adaptor for Coleco and Atari cartridges, 16K and 64K

SPECTRUM & ZX81 EDUCATIONAL SOFTWARE



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RAMpacks (to maximum of 144K), RS-232 interface, disc drive cartridge which also adds the CP/M business operating system, twin 5¼in disc drives, dot matrix printer (made by Seikosha), graphics tablet. Cassette unit, at £39, is essential.
Software: five cartridges (£16 each) and 15 cassettes (at £5.90) available now. Importer is talking to UK software companies
Opinion: An interesting new computer from an experienced Hong Kong manufacturer Lots of add-ons, a rarity for a new micro, the first opportunity to try MSX BASIC and, a nice touch, a built-in joystick Nice editor for use in programming Will all this outweigh the rubber keys and the fact that, like Commodore, the company's own £39 cassette recorder is essential? But then, look how many micros Commodore has sold. See also Spectravideo SV 328 priced at £274.85
CK Computers, 6 Devonia House, High Street, Worle, Weston-super-Mare, Avon BS22 0JR
(0934) 516246

Electron — £199

32K RAM (9K to 21K useable depending on graphics mode used) 32K ROM

Keyboard: typewriter style, 56 keys, space bar, no dedicated cursor control keys, no dedicated user definable keys though the numeric keys double with the use of a function key.
Screen: identical to BBC micro, except for lack of Teletext mode, although this is available as an option
Sound: one channel through internal speaker, otherwise as BBC.
Languages: BBC BASIC is built in and FORTH and LISP are available. **Processor:** 6502A. **Operating system:** Acorn MOS. This makes Electron very compatible to the BBC and will run most of its software. **I/O:** none on basic machine though there is an expanion slot into which an expansion board can be plugged to give the same sort of interfacing options as the BBC but at extra cost. **Number sold:** no figures yet – this is a new machine. **Speed:** medium.
Add-Ons: with forthcoming expansion board the Electron should be able to use most of the add-ons that the BBC can accommodate. Some independent suppliers are producing items, but as this is a new computer only time will tell
Software: a growing range as software houses convert BBC programs.
Opinion: as this computer is almost wholly BBC compatible with only some minor differences most of what I say for the BBC is true here except for the references to price. At this current low price this computer is good value for money. It is, however, in short supply.
Acorn Computers, 4 Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN
Cambridge (0223) 210111

TRS-80 Colour 32K — £219.95

32K RAM 8K ROM

Identical to the standard Tandy Colour Computer (£179.95) except with twice the memory
Tandy, Tameway Tower, Bridge Street, Walsall WS1 1LA
Walsall (0922) 648181

Dragon 64 — £225

64K RAM (up to 64K useable) 16K ROM

Dragon's new model offers three modes of operation: an emulation of the Dragon 32, Extended BASIC with 48K of useable RAM or as a "soft machine." In this mode the BASIC is switched out for machine code programs or to add languages. An RS-232 interface is standard and the OS/9 multi-user operating system can be added. A small amount of disc-based software, including business applications, is available at present.
Dragon Data, Kenfig Industrial Estate, Port Talbot, West Glamorgan SA13 2PE
(0656) 744700

Lynx 48K — £225

48K RAM (13.75K free) 16K ROM

Keyboard: good quality typewriter keyboard, 57 keys, space bar, optional single key keyword entry, dedicated cursor controls, no user definable function keys.

Screen: 40 character by 24 lines text, and 256 by 248 high resolution display in eight colours, user defined characters and lower case. There are one or two peculiarities the screen cannot scroll and works on a plane system of colour generation and the characters are based on an unusual six by 10 matrix. The upshot is that any access to the screen is very slow. It can be speeded up by using only one of the primary colours.

Sound: six-bit digital to analogue converter giving one sound channel covering five octaves driven through internal speaker, output available to external amplifier Envelope control.

Languages: Lynx BASIC (included) is an excellent implementation, well structured, good access to machine code with a machine code monitor. Procedures are catered for as well as other structured programming functions. However it does leave something to be desired with some of the more basic functions of BASIC (sorry). For example, arrays can be only one dimensional. **Processor:** Z80A. **Operating System:** custom, although CP/M is promised when Lynx is given disc drives. **I/O:** Cartridge port, serial printer port. Parallel printer port extra, joystick interface extra. **Number sold in UK:** not available but not many, though number growing **Speed:** fast when not accessing screen but slow when printing or plotting

Add-Ons: Joystick interface, parallel printer interface, printer lead, disc drives promised with CP/M, all available from Camputers. Nothing much from independent suppliers.

Software: some available, and increasing.

Opinion: a much underrated machine suffering from having a funny BASIC and odd screen handling. A very nice machine on its own merits, it is expandable to 96K, 128K or 192K. The 128K and 192K machines have an 80 column display and have CP/M, opening up the opportunity to use a vast range of business software using this operating system. The 48K and 96K Lynxes run Lynx DOS.

Camputers, 33A Bridge Street, Cambridge CB2 1UW
Lang Communications, 01-582 5128

Commodore 64 - £229

64K RAM (40K useable) 20K ROM

Keyboard: typewriter quality, 67 keys, space bar, dedicated cursor controls, four user definable function keys although full use of them can only be had through an expansion program.
Screen: 40 columns by 25 rows, 16 colours, all characters user definable, lower case, inverted output, two character sets. There are four different text modes but the format is the same for all, the only difference is in the handling of the colour. There are two graphics modes giving 320 by 200 and 160 by 200 resolutions in 16 colours. The difference is to do with the colour: one mode uses the attribute system, similar to the Spectrum, the other uses a pallette system where each dot is its own individual colour, similar to the BBC or Dragon computers. Unfortunatley the BASIC does not support the graphics so you must write your own routines or buy a BASIC extension Modes may also be mixed. Eight sprites are available and although the BASIC does not support these directly instructions are given in the manual on how to use them.
Sound: three channel music and noise channel music synthesizer. Full envelope control and waveform selection. BASIC does not support sound directly although, like the sprites, instruction is given in the manual on how to use sound
Languages: Commodore BASIC supplied. Simons BASIC, Forth, Pilot, LOGO, Pascal available from Commodore along with BASIC compiler. **Processor:** 6510 (6502 compatible with memory banking), Z80 available as option. **Operating System:** Commodore Kernal. **I/O:** IEEE 488 serial BUS, RS232, user port, cartridge port, two Atari-type joystick ports, four analogue to digital converters for paddles or proportional joysticks **Number sold in UK:** 250,000. **Speed:** medium
Add-ons: all of the VIC-20 add-ons produced by Commodore will fit Others are exclusive to the 64 that involves the cartridge port, like the Z80 second processor with CP/M. There is also a speech synthesizer using the music synthesizer and several other options, including 12 Megabyte hard discs and daisy-wheel printers. Many add-ons available from independents.

Software: there is now quite a lot of software around, both for games and other applications. With business software and the vast amount of decent peripherals, the Commodore 64 is one of the few computers which can be seriously considered as an effective business micro as well as for use at home.

Opinion: an excellent computer and the available commercial software makes good use of its features The big disadvantage is that the BASIC is simple, making it hard to write your own programs using the sophisticated features. Simon's BASIC, on cartridge, goes some way towards curing this. On the other hand, it is easy to use and memory space is not used to provide fashionable features at the expense of the functions you really need. It is almost totally compatible with the PET series of computers and the massive base of software that provides. Commodore's own cassette recorder must be brought at extra cost. Although interfaces to domestic recorders do exist, it is wise to go for Commodore's reliable recorder.

Commodore Business Machines, 675 Ajax Avenue, Slough, Berks SL1 4BG
Slough (75) 74111

Sharp MZ700 - £249.95

64K RAM 8K ROM

Keyboard: 69 typewriter-style keys including five function keys, four cursor keys, space bar.
Screen: 40 columns by 25 rows text, 80 by 50 graphics. Eight colours. No user defined graphics.
Sound: single channel, three octaves.
Languages: Extended BASIC cassette included in price. Also available: Pascal, Fortran, three versions of Pascal, two assemblers. **Processor:** Z80A. **Operating system:** custom. **I/O:** two joystick ports, video, RGB, port for Sharp printer/plotemblers **Processor:** Z80A. **Operating system:** custom. **I/O:** two joystick ports, video, RGB, port for Sharp printer/plotter and other printers. **Number sold in UK:** a new computer which Sharp says has sold 20,000 in first month. **Speed:** fast.
Add-ons: four-colour printer plotter, Sharp cassette recorder (although most domestic recorders will work), joysticks, other Sharp printers. Coming in January: I/O box for RS-232C, floppy discs etc.
Software: Sharp says 200 titles on cassette are available now starting at £3 95. Ten games are supplied with the computer. Four software houses are said to be writing for the MZ700. Software for the Sharp MZ-80K is totally compatible, although not in colour. And software for the MZ-80A and B needs little modification to work on the new computer.
Opinion: The MZ700 is a stylish design and the printer/plotter and Sharp cassette recorder (both at extra cost) slot into the main unit to give a smart appearance with no trailing wires. It is what has been dubbed a "clean" machine — the language must be added before programming can begin. It means that machine code programs can use nearly all of the 64K of RAM It does mean, however, that you must wait for the BASIC to be loaded from cassette. One 4K ROM handles 512 characters and another deals with the monitor. However, the MZ700 faces stiff competition from the likes of the Commodore 64, which is cheaper.
Sharp, Thorpe Road, Newton Heath, Manchester 10
061-205 2333

Spectravideo SV 328 £274.95

80K RAM (64K approx useable) 48K ROM

Similar to the SV 318 model (£198.95), but with more memory — expandable to 256K — and with a typewriter style keyboard. Aimed to appeal to small businesses, all peripherals for the cheaper model work on this version.
CK Computers, 6 Devonia House, High Street, Worle, Weston-Super-Mare
(0934) 516246

Memotech MTX500 - £275

32K RAM (30K useable) 32K ROM

Keyboard: 58-key typewriter-style keyboard, plus 12-key numeric/cursor keypad and eight function keys
Screen: 40 rows by 24 columns text, 256 by 192 pixels hires, 16 colours.
Sound: three channels plus noise, eight octaves.
Languages: Three languages are built in. MTX BASIC is similar to Microsoft's with extensions, mainly for

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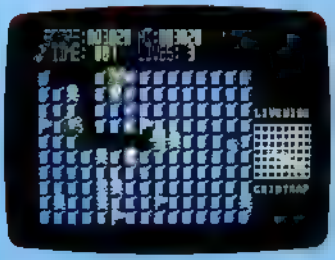

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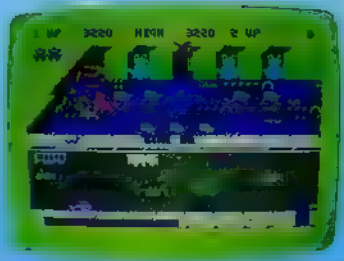

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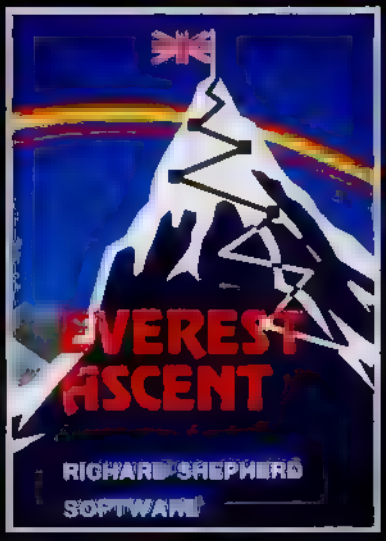

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100% fast action machine code. Avoid the obstacles and hazards to climb the mountain to reach the Spear. Then slay the Condor before it carries your bird off!

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Poor Gordon! His drainpipes are blocked again and the only way to clear them is to drop barrels down them. Gordon stands on the top of his roof with 5 barrels. When the game starts he'll roll one down the roof. Press ***SPACE*** to drop it through the roof accurately into the centre of a drainpipe and you'll score the number of points in the pipe which will start to flash, and Gordon will get the barrel back for another go. The barrel will be lost if the drop is inaccurate or into a pipe already filled, but Flash the dog is on hand. If you know you're going to lose the barrel and you can see Flash peeping out from the bottom-right corner press **Ø** and Flash will save it! Once you clean all 5 pipes, you will get a bonus, but there's a surprise in store before you get the next set of pipes to fill.

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Snail is specially imported from West Africa are being kept in Dr. Van Winkleghoff's laboratory for genetic experiments. The Doctor has turned them into a super-breed of snail who now leave behind a trail of super glue that will trap any snail touching it. Two of the snails, continually moving and controlled by the players, escape from their pens into the laboratory. Unfortunately, only one of the snails can escape from here into the outside world without raising the alarm. You must therefore trap your opponent and then try to escape through the small door which will then appear.

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by Andrew Hainey

As a ship testing the latest star ship breakdown in your guidance systems causes you to materialise in the breeding grounds of the Psygophorus, an unbelievably nasty insect life form which kills anything entering its space. Survival depends on destruction of the eggs before they hatch to form a SWARM. They can use your laser energy to mutate at an alarming rate and the only escape from the devastating attack of a Swarm is by destroying the Psygophorus in only one brief stage of its life cycle.
CAN YOU SURVIVE this high scoring game?

VIC 20 unexp
ALIEN VORTEX
by Andrew Hainey

It is the 21st Century. **unemployment 99.9%** due to 300% inflation, money replaced by credit discs. To relieve boredom the R.S.P. sets up huge gambling arcades – debts run high, inhabitants who cannot pay take part in 'THE GAME'. Transported to Launch Base 3 they are seated into a Zelton Earth Defender and attacked by waves of mutant birds, specially bred on the Space Station Alien. Moneylenders bet on the length of time ill-fated players survive. So recovering their losses. SET your body modulator to HYPERDRIVE. PRIME your firing fingers and HANG LOOSE.
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SINCLAIR ZX 81 16K
SPECTRUM 48K
ADMIRAL GRAF SPEE
by Simon Mansfield

An original game of strategy based on historically accurate records of the Graf Spee's formidable presence in the North and South Atlantic.
As her Captain use full graphic instrumentation to calculate speed, compass bearings, fuel, distance, ammunition stales, locate and manoeuvre into visual range and destroy enemy ships which can also evade, seek and destroy you. Attacked ranges can only be destroyed by the same number of salvos or torpedoes as were necessary for the damage during the original action.
7 levels of difficulty.

VIC 20 16K
DRAGON 32K
MICROPOLY
by Richard Fry & Simon Lacey

Play this version of the family board game with a competent and challenging microbanker and property tycoon. State of game and board on instant recall - or the game saved.
Game for up to four players AND the computer.

DRAGON 32K
SEARCHWORD
by Ian A. Macey

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An irresistible game for word puzzle enthusiasts, this program offers endless permutations. The computer will accept any list of words containing from 3 to 12 letters and conceal them within a letter grid until the player identifies them by giving the correct start position co-ordinates and direction. Program also includes two demonstration files and word save facility. Hours of enjoyment for one or more players.

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graphics. Logo is the easy-to-use language used mainly in schools. Noddy is Memotech's interactive language Built-in ROM routines include an assembler/disassembler. **Operating system:** custom. **Processor:** Z80A **I/O:** RGB for a monitor, hi-fi sound, two joystick ports, Centronics interface. **Number sold in UK:** computer only recently launched. **Speed:** medium to fast
Add-ons: available now — RS-232 board, 8K EPROM cartridge, 64K of plug-in RAM. Promised soon — Pascal on cartridge, 80-column board, "Silicon Disc" with ½megabyte of RAM, floppy and hard discs running under CP/M, the operating system used for thousands of business programs.
Software: six cassettes available now and Memotech says dozens more will be available soon, on tape and cartridge. Two programs are free with each computer.
Opinion: An all-British designed and manufactured computer from the people best known for their ZX81 and Spectrum add-ons Many of the ideas in the MTX computers came from a business micro which an associate company was developing. Robust with a lot of features as standard and aimed at the top end of the home computer market, also occupied by the likes of the BBC micro. Metal case gives a solid feel. See also Memotech MTX512 (£315).
Memotech, Station Lane, Witney, Oxon OX8 6BX
(0993) 2977

NewBrain AD — £299

32K RAM (28K useable) 24K ROM

Keyboard: 62 hard plastic sculptured keys in QWERTY layout, but smaller than typewriter keys, short space bar
Screen: monotone only. 40 or 80 by 24, 25 or 30 text and 640 by 230 high-resolution. Character sets for most European languages giving a total of 512 characters, all user-definable from keyboard Full screen editor
Sound: none, unless expansion fitted.
Languages: ANSI BASIC **Processor:** Z80A. **Operating system:** custom. **I/O:** 50-pin expansion port, monitor, two RS-232 and two tape sockets **Number sold in UK:** 6,000 **Speed:** medium to fast
Add-ons: controller for up to four 5¼in floppy discs (£155), expansion module adds 64K of RAM and CP/M 2.2 (£253), disc drives, plug-in 8K EPROM box (£34), two-hour battery pack (£74) fits under the computer, adding half-an-inch to its height Promised soon: network module to link up to 16 computers plus peripherals, costing about £800.
Software: some games and business applications, like databases and word processing Now CP/M is available along with discs, more business software should become available.
Opinion: the computer which could have become the BBC micro was dropped by Grundy after losses. It has now been taken up by a Dutch company, Tradecom, and is being made by the same UK manufacturer Without colour it must be regarded as a computer for the serious enthusiast or business And that is how its new UK distributor Brainwave Software is directing its marketing Its size, 10¾in by 6in by 1¾in, and battery pack means it can also be used as a portable in areas like stock control. One of the cheapest ways to get CP/M, by far the most popular operating system for business software. See also NewBrain AD (£299)
Brainwave Software, Tilbury-Juxta-Clare, Great Yeldham, near Halstead, Essex CO9 4JT
0787 237831

Lynx 96K — £299

96K RAM (37.5K useable) 20K ROM

Similar to the 48K Lynx(£226), except for the increase in RAM and that the BASIC has 4K of expansion to expand the graphics, sound and I/O ability. It can also use the 24K of normally unavailable RAM as a "RAM disc", supporting 48 different files The 48K Lynx can be upgraded to 96K for £89 95.
Camputers, 33A Bridge St, Cambridge CB2 1UW
Lang Communications, 01-582 5128

TRS-80 Col 32K Ext BASIC — £299.95

32K RAM 16K ROM

Identical to the standard Tandy Colour Computer (£179.95) except for doubled RAM and Extended Colour BASIC.
Tandy, Tameway Tower, Bridge Street, Walsall WS1 1LA Walsall (0922) 648181

Atari 800 — £299.99

48K RAM (amount useable depends on graphics mode in use) 16K ROM

Similar to the Atari 400 (£149.99), except it has a real typewriter style keyboard, more memory and two cartridge slots instead of one An Atari 800XL is due out early next year with a re-styled casing, built-in BASIC, more screen modes, plus other features. However, the Ataris are software compatible See also Atari 600XL (£160) which has succeeded the Atari 400
Atari, Railway Terrace, Slough, Berks SL2 5BZ
Slough (75) 33344

Genie II 16K — £299.99

16K RAM (15K useable) 16K ROM

Keyboard: typewriter style, 71 keys, space bar, dedicated cursor control keys, four user definable function keys.
Apart from improved keyboard and lack of internal cassette deck, identical to Genie 1.
Lowe Computers, Chesterfield Road, Matlock, Derbyshire DE4 5LE
Matlock (0629) 4057/4995

Memotech MTX512 — £315

64K RAM (62K useable) 24K ROM

Identical to the MTX500 (£275), but with more RAM.
Memotech, Station Lane, Witney, Oxon OX8 6BX
(0993) 2977

Nascom 2 — £327.75

2K RAM (800 bytes useable) 12K ROM

Keyboard: 57 keys, typewriter style.
Screen: monochrome, 48 columns by 16 rows, block graphics.
Sound: none.
Languages: Microsoft BASIC Operating system

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custom. **Processor:** Z80A. **I/O:** RS-232 and eight-way input-output. **Number sold in UK:** not known.
Add-ons: 64K and 256K RAM boards, I/O which also adds clock and extra RS-232 interface, floppy disc control board, video controller to add hi-res and colour, 5¼in single and twin disc drives. Plus Lucas approved products from independents.
Software: Lucas says a lot is available.
Opinion: This computer is for the serious hobbyist. It comes as a keyboard and board. You have to either case it yourself — the Lucas case costs £100 — or get a dealer to do it for you. You would also have to add memory; you cannot do much with 800 bytes. Computer was first made in 1979 and taken over by Lucas about two years ago. The Nascom 2 can also be bought as a kit for £258.75. The Nascom 3, ready-built with 48K of RAM, costs £631.35.
Lucas Microcomputers, Welton Road, Wedgenock Industrial Estate, Warwick CV34 5PZ
(0926) 487733

Genie I 16K — £330.05

16K RAM (15K useable) 13.5K ROM

Keyboard: typewriter style, 54 keys, dedicated cursor control keys, no user definable function keys, space bar.
Screen: 32 or 64 columns by 16 lines, no colour, no hi-res, no user definable characters. Inverse available, lower case, pixel graphics gives 148 by 48. Optional hi-res board gives 384 by 192.
Sound: one channel through internal speaker.
Languages: Microsoft BASIC, Pascal, Fortran, Cobol, Forth, APL, and PL1 are available from Lowe. **Processor:** Z80. **Operating System:** custom included but various available including CP/M and LDOS for disc drives. Compatible with the TRS-80 model II. **I/O:** two cassette ports, otherwise none included but expansion box has printer interface. **Number sold in UK:** a reasonable amount, but to this must be added the vast number of TRS-80s that have been sold as the Genie is virtually identical in operation. **Speed:** slow to medium.
Add-ons: not many due to the decline of this type of computer and the rise of the colour hi-res machine.
Software: Large selection, mainly from Tandy.
Opinion: this type of machine was very popular in its day and as such has a larger user base, and this gives it a wide range of software. With the appropriate adaptor Tandy peripherals will work. A large sturdy machine that includes its own tape deck and is also reasonable for small business use.
Lowe Computers, Chesterfield Road, Matlock, Derbyshire DE4 5LE
Matlock (0629) 4057/4995

Genie II 48K — £341.55

48K RAM (47K useable) 16K ROM

Except for increase in memory, identical to 16K Genie II
Lowe Computers, Chesterfield Road, Matlock, Derbyshire DE4 5LE
Matlock (0629) 4057/4995

Genie I 48K — £365.70

48K RAM (47K useable) 16K ROM

Identical to 16K Genie I except for the price and memory and the ability to run certain operating systems that will not fit on the 16K version.
Lowe Computers, Chesterfield Road, Matlock, Derbyshire DE4 5LE
Matlock (0629) 4057/4995

BBC model B — £399

32K RAM (28K to 9K useable depending on graphics mode used) 32K ROM

Keyboard: typewriter style, 73 keys, 10 user definable function keys, dedicated cursor control keys, space bar
Screen: very advanced. The simplest mode is Teletext compatible and gives eight colours, flashing characters, double height, and block graphics. Text is 40 columns by 25 lines. There are seven other modes of screen operation ranging from 640 by 256 hi-res in two colours with 80 by 32 text to 160 by 256 hi-res in eight colours with 20 by 32 text with eight flashing colours. All 256 characters are user definable in all but the Teletext mode.
Sound: three channel music with a noise channel through internal speaker Full envelope control is available from BASIC

Languages: BBC BASIC is included — a very comprehensive implementation An assembler is also built in for machine code access. Forth, Lisp and BCPL are also available **Processor:** 6502 A. **Operating system:** Acorn MOS. **I/O:** RS432 (RS-232 compatible) and Centronics printer ports. Four analogue to digital converters for joysticks etc. Eight bit programmable user port. The Tube allows connection of second processors and so on to the 1 MHz bus. Disc interface, Econet networking, speech synthesizer can be added **Number sold in UK:** 150,000. **Speed:** fast
Add-ons: a great deal available from independents. However, Acorn has been slow to provide support and at present only disc drives, Econet and speech synthesizer are available But Acorn are promising other things.

Software: a very large well written range available, including a lot from Acornsoft, the maker's software arm. Many educational programs of varying quality.

Opinion: the BBC is an excellent machine if you ignore the high price. Support from independent suppliers is superb, but Acorn has been slow on the hardware side. The keyboard is very good and there is a useful set of function keys. The screen uses split cursor screen editing which is the next best thing to full screen editing but not quite as easy to use. The BASIC is excellent and makes good use of all the hardware features. This computer is used by about 75 per cent of all secondary schools. So it is good for education as well as games. It also makes a good business computer, particularly with networking available for the future A good all rounder.

Acorn Computers, 4 Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN
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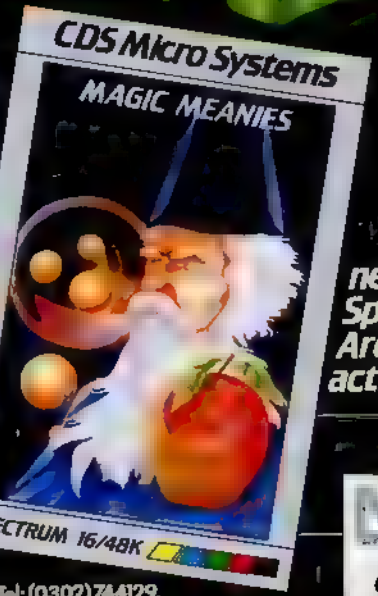

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BLASTERMIND

SPECTRUM 48k £5.50

At first glance this might seem to be just another version of a very popular game How wrong can you be!!! True, the start is simple enough The Spectrum picks a code of numbers or colours with a selection of levels of difficulty — and invites you to do the same You then take it in turns to guess each others code from the clue supplied after each guess. An extremely well written, fast and very clearly displayed game with almost inevitable defeat

This was exactly as intended but unfortunately *something went wrong*. During the programming strange uncomplimentary messages began to appear on the screen At first they were so few they were not taken too seriously but soon they could no longer be ignored Somehow the Spectrum had been given a personality — a rather devious, supercilious, dislikeable, hateful, horrible mind

✱ Side B contains a version of the game compatible with the excellent Currah µSpeech unit — even worse!! ✱

THE QUEST OF MERRAVID

VIC 20 (16k) £7.95
or Commodore 64 £7.95

A really challenging and enjoyable adventure. written by a confirmed adventure addict who grew tired of the ease with which he solved other adventures himself Will accept and act on sentences containing up to nine words.

The adventurer becomes Merravid, charged with the task of finding, taking and then returning the magic Firestone of the Dwarves However, overcoming the many novel and original hazards is no easy matter Careful and imaginative thought is required if progress is to be made and the Firestone tracked down to the lair of the Dragon of Thargon Even then the Dragon has to be defeated and the stone retrieved A compulsive, extremely enjoyable and very user friendly adventure

HARRIER ATTACK

any ORIC – 1 £6.95
any SPECTRUM £5.50

Pure machine code super-fast action-packed highly addictive arcade-style game requiring great skill The harrier takes-off from an aircraft-carrier and flys over seaborne defenses to attack enemy installations on a nearby island The harrier may fly faster slower, higher or lower and has bombs and cannon fire with which to protect itself and make its own attack If it flies too high it is detected by enemy jet-fighters (which it may counter-attack) — so it needs to hug the mountainous terrain which also varies with every new game But the island is heavily defended by anti-aircraft rockets and tanks which again the harrier may counter-attack or try to fly through A tally is kept of fuel speed altitude ammunition, plus player score and high score Finally the harrier must make its bomb-run over the enemy base before returning past more hostile shipping to its own carrier

SCUBA DIVE

any ORIC – 1 £6.95
SPECTRUM 48k £5.50

Pure machine code with super cartoon graphics. You are in control of a diver who must swim down through jellyfish, sharks, barracuda and a host of other under-sea nasties to locate the entrance of a submarine cave He must then follow its twisting and branching passages which change with every new game to locate the magical giant oysters with their fabulous treasure of enormous pearls Many of the passages lead to dead-ends, while some are filled with horrible underwater monsters Each dive has to be timed carefully so that there is enough oxygen left for the return journey which is further frustrated by the diver's boat shifting anchor and threatening to decapitate him with its propellor This game which features three divers, player score, high score, hall of fame and sound effects, presents perhaps the ultimate epic arcade adventure

ALSO AVAILABLE

JUNGLE TROUBLES — frustrating addictive. funny silly Come back Tarzan all is forgiven! SPECTRUM £5.50
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Tempting treasure... but mind the mines

Put a foot wrong and you won't survive to enjoy the riches on offer in Neil Cooper's game for either model of the Spectrum

Tread carefully and you could collect heaps of treasure. But if you put a foot wrong in the Minefield . . . well, it could be nasty.

You move around the screen by using keys of your choice, entered at the start of the game, and collect as much treasure as you can while avoiding the mines and the electrified fence.

To escape with your treasure, move your man onto an exit. You will then be transported to another minefield which will contain five more mines and one less exit.

How it works

- **10** GOSUBs to graphics and instructions
- **20** set colours
- **30-80** set variables
- **90-100** PRINT minefield, score, lives
- **110-210** main loop
- **7000** game over, another go?
- **8000-8030** instructions
- **8050** define keys
- **9000-9070** define graphics
- **9999** SAVE game

If you hit a mine or the fence you will lose one of your three lives. Full instructions are in the program.

Graphics characters: **A** electrified fence, **B** mines, **C** exits, **D** treasure, **E** man, **F** explosion.

Variables

- **a,b** position of man
- **a1,b1** numbers to be added to a, b
- **L** number of lives left
- **m** amount of mines
- **e** amount of exits
- **a$** holds minefield
- **u$, d$,l$, r$** keys to move up, down, left, right
- **z$** dummy variable

```
10 RESTORE : GO SUB 9000: GO SUB 8000
20 ?# 0: PAPER 6: BORDER 6: CLS
30 LET l=3: LET a=0: LET a=10: LET e=6
40 LET a=10: LET b=13: LET a1= 1: LET b1=0
50 DIM a$(20,32): LET a$(1)="AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA": LET a$(20)=a$
11: FOR f=2 TO 19: LET a$(f,1)="A": LET a$(f,32)="A": NEXT f
60 LET e=e-(e-1): LET a=a+5: FOR g=1 TO m: LET a$(INT (RND*17 +2),INT (RND*
9 +2))="B": NEXT g: IF a$(a-1,b+1)=" " THEN LET a$(a-1,b+1)="C": NEXT f
70 FOR f=1 TO 10: LET a$(INT (RND*17 +2),INT (RND*29 +2))="D": NEXT f
80 FOR d=1 TO m: LET a$(INT (RND*17 +2),INT (RND*29 +2))="C": NEXT d
90 FOR h=1 TO 20: PRINT AT h,0;a$(h): NEXT h
100 PRINT AT 0,0; INK 6; PAPER 2;"SCORE:";s;AT 0,24;"LIVES:";l;AT 21,0;"MINES:"
;m;AT 21,24;"EXITS:";e
110 PRINT AT a,b; INK 1;"E"
120 IF INKEY$=u$ THEN LET a1=-1: LET b1=0
130 IF INKEY$=d$ THEN LET a1=1: LET b1=0
140 IF INKEY$=l$ THEN LET a1=0: LET b1=-1
150 IF INKEY$=r$ THEN LET a1=0: LET b1=1
160 PRINT AT a,b;" ": LET a=a+a1: LET b=b+b1: PRINT AT a,b; INK 1;"E": BEEP .00
5 -2
170 IF a$(a,b+1)="D" THEN LET a=a+10: BEEP .01,0: PRINT AT 0,0; INK 6; PAPER 2;
"SCORE:";s: LET a$(a,b+1)=" ": GO TO 200
180 IF a$(a,b+1)="C" THEN FOR f=0 TO 19: BEEP .01,f: NEXT f: GO TO 40
190 IF a$(a,b+1)="A" OR a$(a,b+1)="B" THEN LET l=l-1: FOR f=30 TO -30 STEP -1:
PRINT AT a,b; INK 2; PAPER 6; FLASH 1;"F": BEEP .005,f: NEXT f: PRINT AT 0,24; I
NK 6; PAPER 2;"LIVES:";l: IF l=0 THEN GO TO 40
200 IF l=0 THEN GO TO 7000
210 GO TO 110
7000 FOR f=10 TO -10 STEP -1: BEEP .009,f: NEXT f: PRINT AT 1,11; FLASH 1;"GAME
OVER": INPUT "ANOTHER GO ? ": LINE z$: IF z$="y" THEN GO TO 20
7010 STOP
8000 INK 7: PAPER 1: BORDER 1: CLS
8010 PRINT AT 0,10; INVERSE 1;"MINEFIELD"
8020 PRINT AT 2,0;"The object of the game is to" "move your man  E  around the"
 minefield picking up treasure" " D  and avoiding the electrifiedfence  A  and i
ne mines  B  "
8030 PRINT "To escape the minefield move" "your figure onto one of the     exits
 C  You will  then be      transported to another minefieldwith one less exit an
d five moremines."
8040 INPUT "PRESS  ENTER  TO CONTINUE ": LINE z$: CLS
8050 INPUT "ENTER KEY TO MOVE UP ": LINE u$ "TO MOVE DOWN ": LINE d$  TO MOVE  E
FT ": LINE l$ "TO MOVE RIGHT ": LINE r$
8060 INPUT "PRESS  ENTER  TO PLAY ": LINE z$: CLS : RETURN
9000 FOR f=1 TO 6: READ z$: FOR n=0 TO 7: READ z: POKE USR z$+n,z: NEXT n: NEXT
f
9010 DATA "a",129,66,24,36,36,24,66,129
9020 DATA "b",0,0,0,24,126,255,255,255
9030 DATA "c",219,153,0,219,219,0,153,219
9040 DATA "d",0,31,35,69,249,138,140,248
9050 DATA "e",28,28,8,28,42,8,28,34
9060 DATA "f",98,84,199,28,117,74,102,44
9070 RETURN
9999 CLEAR : SAVE "minefield" LINE 1
```

Can you keep your act together?

As a cabaret artist, you'll be in a spin when you play B. M. Phillips' game for the unexpanded VIC-20

Plate Spinner is based on the well-known plate-spinning cabaret act — and you control the little man who has to keep the plates on top of the poles spinning.

The faster they spin, the more your points mount up. It's easy at first, but as the game proceeds the plates become less and less stable, and the little man has his work cut out to keep them all going.

As they slow down, they wobble more and more until they fall off, which loses you points. When three plates have fallen the game ends.

The man can either be controlled by using a joystick or from the keys. Full instructions are given in the program.

How it works

The program is divided into two parts. Defplate defines the main characters, and the main program, Plate Spinner, contains the game. The structure of the main program is as follows

10-50 initialise joystick
60-170 instructions
190-510 draw a screen, define variables/constants at start of game
520-650 move man
660-780 subroutine to spin plate
790-910 subroutine to wobble plates
920-1230 subroutine to drop plate
1240-1280 start new game
1290 DATA for plate screen locations
1300 DATA for plate characters
1310-1370 joystick subroutine

Main constants and variables

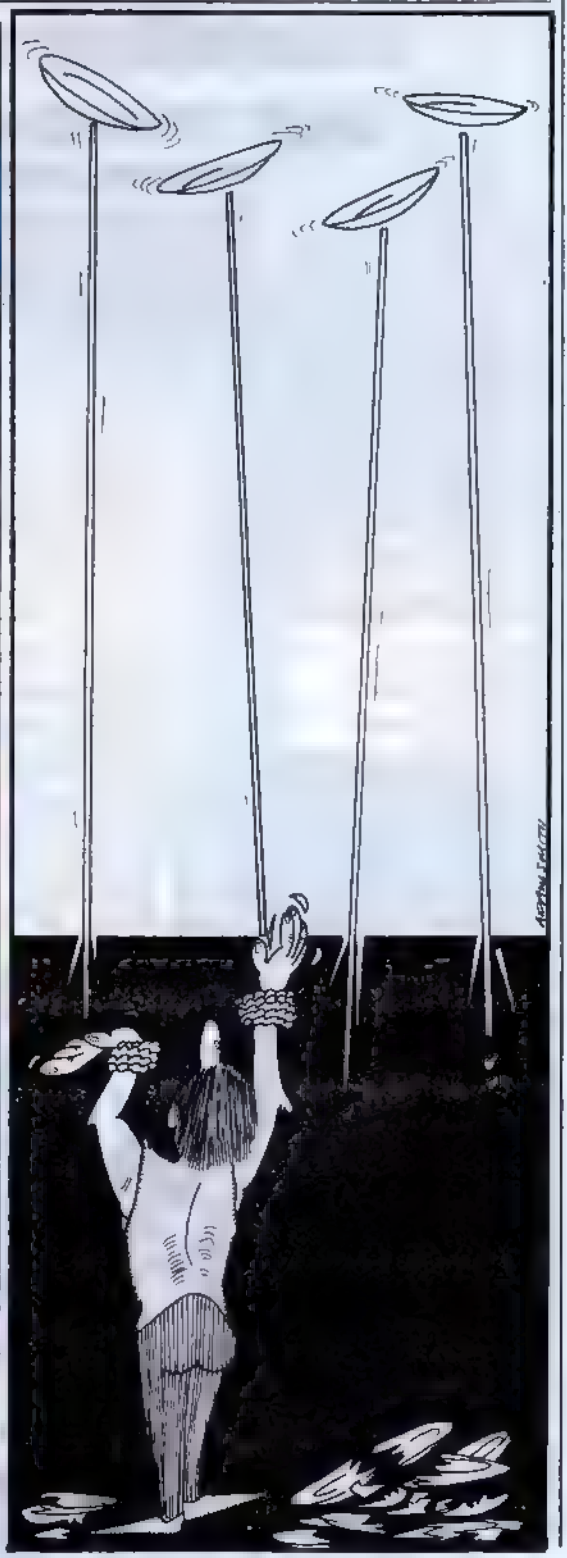
P(I) POKE values for plate screen locations
W(I) wobble factor for each plate
M1,M2,M3 characters for man
C(I) characters for plate
M current character for man
N(I) current character for plate
S2,S4,V sound registers
X current position of man
X1 last position of man
SC score

Listing 1 — Defplate defines the main graphics

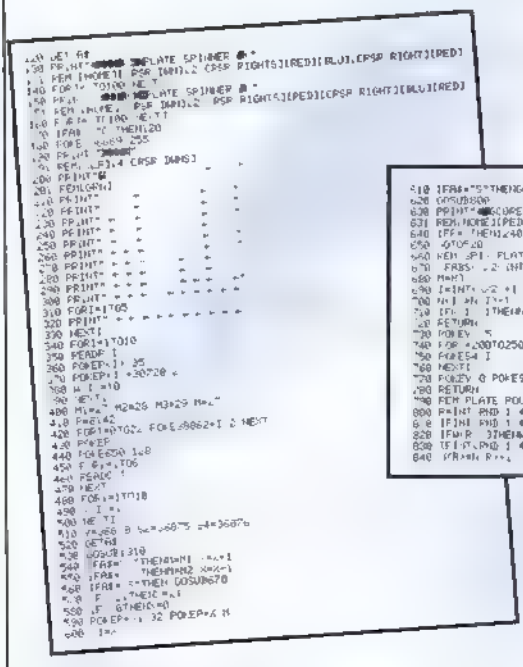
```
10 PRINT"■■■■■■■■■■PLATE SPINNER"
11 REM<■■■■■E JER 1014 CRSR DWN$14 CRSR RIGHT$1
20 PRINT"■■■■■■■■■■PLEASE WAIT"
25  REM(  CRSR DWN$,16 CRSR RIGHT$1
30 POKE5, 26:POKE54,0:CLR
40 FOR =7168TO7679:A=PEEK( )+256*B:NEXT
50 FORC= 3647TO7423:READA:POKEC,A:NEXT
60 FORC= 4481TO5119:READA:POKEC,A:NEXT
70 DATA,4 ,20 ,18 ,28 ,16 ,40 ,36 ,54,40 ,48,144,112,16,48,72 ,216
80 DATA56 ,56 ,64 ,56 ,16 ,40 ,40,68 ,16 ,0 ,32,9 ,00 ,6 ,50 ,,56
90 DATA ,6 ,16 ,16 ,16 ,16 ,16 ,16
100 DATA0,0 ,62 ,65 ,,X0 ,,4 ,0 ,0 ,0,0 ,124 ,130,65,,62,0,0
110 DATA0 ,0 ,28 ,34 ,68 ,152 ,96,0 ,0 ,96,,152 ,68 ,34,,28 ,0,0
120 DATA: ,28 ,,4 ,,6 ,,8 ,136 ,176 ,192,,192, ,16 ,136 ,68 ,66 ,34 ,25 ,
130 DATA ,2 ,,6 ,34 ,24 ,68 ,68 ,,2 ,48 ,48 ,72 ,68 ,68 ,34 ,34 ,18 ,12
140 DATA16 ,48 ,48 ,48 ,48 ,48 ,48 ,16
150 PRINT"■■■■■PRESS RETURN TO LOAD      MAIN PROGRAM"
151 REM 3 CRSR RIGHT$1(CRSR DWN)
160 PRINT"■■■■■ CRSR(3)"LOADING"
161 REM,4 CRSR DWN) 3 CRSR UP)
```

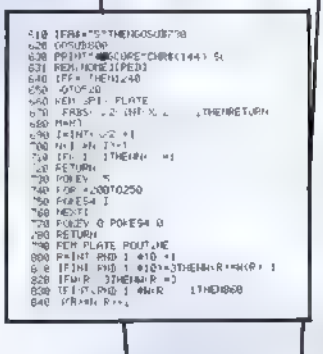
Listing 2 — the main program

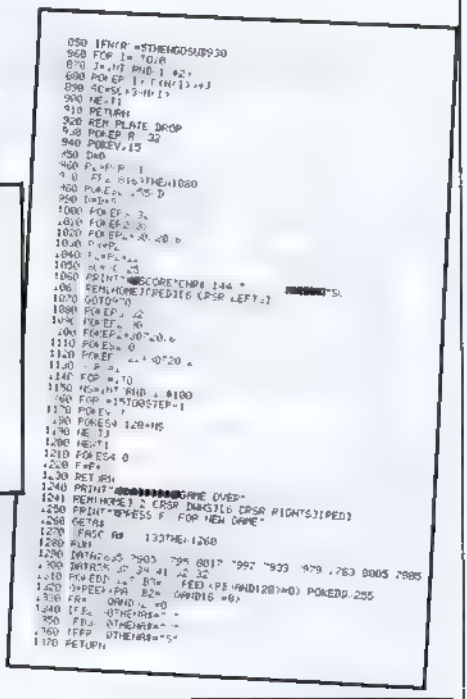
```
,0 DIM#,(,0) DIMN ,0
20 DIMJS(2,2) POKE37139,0 DD=37154 PA=37137 PB=37152
30 POKE36879,250
40 FORI=0TO2:FORJ=0TO2:READJS(I ,J ):NEXTJ ,I
50 DATA ,2 ,,22 ,,1 ,,0 ,1 ,21 ,22 ,23
60 PRINT"■■■■■PLATE SPINNER
61 REM(MODE CRSR DWN$14 CRSR RIGHT$1)(BLU)
70 PRINT"■■■■MOVE THE MAN TO KEEP  THE PLATES SPINNING"
71 REM(,  CRSR DWN$1,CRSR RIGHT$1)(BLU)
80 PRINT"■■USE KEYS , OR    TO    MOVE THE MAN AND KEY  0 TO SPIN THE PLATES"
90 PRINT"■■■■ USE JOYSTICK"      USE FIRE TO SPIN"
100 PRI T ■■■■■PRESS C TO CONTINUE"
101 REM(,CRSR RIGHT$14 CRSR DWN$)(PUR)
110 POKE 36869,255
```



VIC-20 PROGRAM







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Poor little Henry is the hen-pecked hero of this domestic tale. One night Henry can take no more. He steals his wages from his wife's purse, and sneaks out of the house being careful not to wake the baby or trip over the cat, and heads for the bright lights to have some fun. Trouble is he runs out of money. His only way to raise some cash is to gamble his few remaining pounds on the spinning wheel of the roulette table.

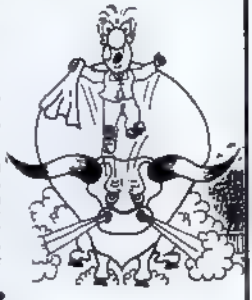
Just as Henry is getting in to his evening a the tables his wife Mad Martha has noticed his absence. Realising Henry has absconded with the housekeeping she sets out after him with an axe.

Guess what part you play in this happy tale. That's right, you're Henry. Watch out for that axe.

A game to invest in . . funny, genuinely original, and the graphics are great hit the key to begin, the Spectrum plays a real Hollywood-style movie theme tune, and the hunt is on!
Personal Computer News

And now –

Mad Martha II



Time for the annual holiday and Martha decides to visit her half-cousin Manuel, who is a waiter in a posh hotel in Barcelona.

One afternoon, Martha sets out on a bus tour with her son, young Arbuthnot, leaving orders for Manuel to keep an eye on Henry. Unbeknown to Martha, crafty Henry has a Spanish pen-pal, and has planned a secret rendezvous. Henry leaves the hotel, brimming with enthusiasm and Manuel (who is totally wacky!) is hot on his trail. The adventure takes us through the thrills and spills of a madcap chase, taking in amongst other delights, a bull fight in which poor Henry is forced to play the leading role. Guaranteed laughs and fun for all the family!

★ FOR 48K SPECTRUM **ONLY £6.95** *Post & Packing 40p* ★

Marvellous adventure, really dotty a refreshing change from some of the doomladen programs encountered nowadays a game where you won't get to the next stage without solving the present conundrum.
Popular Computing Weekly

★ Full adventure format – accepts multiple commands at one entry, in plain English
★ Witty, intelligent replies to commands ★ Skill level select for beginners
★ Every location in full screen, high-res, colour graphics
★ Three exciting arcade-type games as an integral part of the adventure
★ Full help facility and save game command

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AGF

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PROGRAMMABLE INTERFACE

The AGF Programmable Joystick Interface is a unique design offering the use of any Atari-compatible joystick with absolutely all software, whether it is cassette or ROM cartridge, with the Sinclair Spectrum or ZX81.

The hardware programmable interface requires no additional software and accurately replicates the keys of the computer in a manner which is responsive to absolutely *ALL* key reading methods, both BASIC and Machine Code.

The interface does not interfere with key operation and can therefore be used simultaneously with the keyboard.

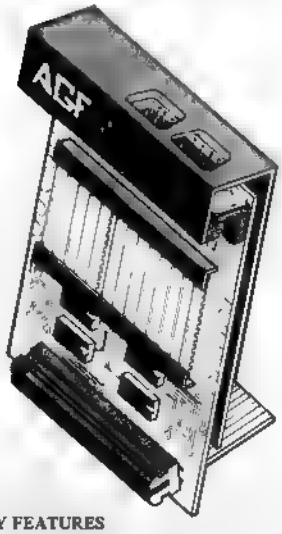
There is no need to remove the interface once fitted as the rear extension connector will accommodate further expansion, i.e printers or RAM packs etc. This important feature avoids excessive wear to the expansion port.

The key replication principle pioneered by AGF means that your own programs can use eight directional joystick movement by utilising simple key reading BASIC.

Two joystick sockets are provided which share the same keys, for use with the majority of two player games. Several interfaces may be used on the same computer for multiple joystick applications.

The interface is programmed by a two digit code, which is looked up on a programming chart supplied, for each direction and firing button. The two numbers are then selected on a pair of leads which are clipped onto appropriately numbered strips on the interface.

Once configured this can be marked on a Quick Reference Programming Card for storing with the game. As the programming is *not* power dependent the interface retains the last configuration made and can be immediately used when next switched on.



KEY FEATURES

- Programmable design gives TOTAL software support.
- Accepts Atari, Competition Pro, Wico, Starfighter, Quick Shot, Le Stick etc.
- Rear extension connector for all other add-ons.
- Free demo program and instructions.

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- Programmable Interface Module as illustrated, complete with clip-on programming leads.
- Self adhesive programming chart detailing how to define which key is simulated by UP, DOWN, LEFT, RIGHT, and FIRE. This can be fixed on to the case of your computer or if preferred the protective backing can be left on. The chart is made of a very durable reverse printed plastic and is extremely easy to read.
- One pack of ten Quick Reference Programming Cards for at-a-glance setting to your games requirements. The card allows you to mark the configuration in an easy to read fashion with space to record the software title and company name.
- Video Graffiti demonstration program which is written totally in BASIC to illustrate how all eight directions and fire can be read. This is also a useful high resolution drawing program.
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Mind-bending micro games

Are these thinking games worth a second thought? Here's our review panel's opinions

Brainstwisters 1 TI-99/4A £8

Stainless Software, 10 Alstone Road, Stockport, Cheshire

The first of a series of cassettes all containing strategy games

The first program, Decoder, is similar to Mastermind, in which you must discover a secret number. The number may have up to nine digits.

After your guess is entered the computer displays two digits. The first digit indicates how many numbers in your guess are in the secret number. The second digit indicates how many numbers in your guess are also in the correct position.

One or two players may take part in the game. In the two player version, each player has their own secret number to guess

The second program on the cassette is called Switchboard

A 3 by 3 grid is drawn on the screen, and each square is numbered one to nine. Some of the squares also have red squares drawn within them

The object of the game is to have a red square in each of the nine positions

If, for instance, "1 367" was printed on the screen, key 1 (on the computer keyboard) would reverse squares 3,6 and 7. So if 3 and 7 had a red square in them, but 6 was empty, then by pressing key 1, 3 and 7 would be empty, but 6 would have a red square in it

J.J

instructions	80%
playability	80%
graphics	80%
value for money	80%

★★★★

Brainstwisters 2 TI-99/4A £8

Stainless Software, 10 Alstone Road, Stockport, Cheshire

This second cassette in the Brainstwisters series consists of two well-known programs — Solitaire and Echo

The object of Solitaire is to rearrange rows of cards, so that each row is made up of cards of the same colour. There are dots on the cards, too, and to complete the game the dots must run in order from one, on the left hand side of the screen, to nine, on the right

There are two skill levels, the hardest being rather pointless, as the game could be impossible to complete. Solitaire is, of course, for one player only

Echo, the second game on the cassette, is amazingly similar to a popular electronic game

The object of the game, for those of you who don't know, is to repeat various sequences of lights/sounds made by the computer

The computer starts off by playing three random notes. If you repeat these without any mistakes, an extra note will be added to the sequence. This carries on until you make a mistake.

There is a time limit on how long you have to respond, which decreases as you reach higher levels.

J.J.

instructions	90%
playability	90%
graphics	90%
value for money	80%

★★★★

Blastermind 48K Spectrum £5.50

Martech Games, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE

This is a variation of that well known game Mastermind, which you either like or you don't.

In this version the variations consist mainly of insults to the human race in general and the player in particular

To play the game, you choose either a colour or a numerical code, with either four or five colours or digits in the code. You also have a choice of up to nine characters or colours in the code

After choosing heads or tails for who (which?) goes first, you have up to 20 guesses

The answer to your guess is a two-digit code. The first digit indicates the number of digits or colours in the guess which are correct, and in the right place. The second digit indicates how many digits or colours are correct, but in the wrong order. If you make a mistake you are told about it in no uncertain terms

The graphics are nothing spectacular, and a major programming fault is the unnecessary display of the playing board at times, together with "press enter to continue"

S B.

instructions	100%
playability	75%
graphics	50%
value for money	80%

★★★★

Crossword Puzzler 32K BBC £5

National Extension College, 18 Brooklands Avenue, Cambridge CB2 2HN

Whenever I attempt a crossword puzzle I always seem to end up with a crossed-out, corrected and re-corrected mess! How pleasant, therefore, to solve a crossword on a computer screen where mistakes can be painlessly erased

The Crossword Puzzler package comes with Word-Play, a crossword presentation program, Xword Gen, a program which allows crosswords to be prepared and saved on tape, plus four sample crosswords

The crosswords are clearly and crisply presented on the screen, even at the maximum size of 15 by 15. However, I was disappointed that the crossword generator only took in raw data, so that the crossword still has to be designed on paper first. And there is no printout facility

Solving a crossword is a little tedious, as Word-Play always requires explicit answers to questions (Y or N with no defaults). It also encourages cheating, as it asks if you want the answer even before you've had a go!

Grumbles aside, all attempts are recorded, so competitive and educational crosswords are possible, and it all makes a very pleasant change from space invaders.

P.D.

instructions	75%
ease of use	60%
display	80%
value for money	75%

★★★★

Brainstwisters 3 TI-99/4A £8

Stainless Software, 10 Alstone Road, Stockport, Cheshire

This consists of two programs, Hangman and Decypher.

Hangman is an excellent reproduction of the old favourite. There are three skill levels which range from a single word to a common phrase.

The graphics are very good, and colour is used well, but sound could be improved upon.

If you correctly guess the word, a simple tune is played. If not, the computer very ruthlessly proceeds to execute the poor man in the gallows, and displays the correct word on the screen

The object of Decypher is to crack a substitution code

A series of lower case letters are displayed at the top of the screen. These will form some words or a phrase when the substitution code is cracked

The lower case alphabet is displayed at the bottom of the screen, and after you have positioned an arrow over your chosen letter, you must enter another letter from the keyboard. This letter then replaces all your chosen letters at the top of the screen. The procedure continues until you have completed the phrase at the top of the screen

Help is supposed to be given if the space bar is held down, but, unfortunately, this only caused the program to stop due to an error

J.J.

instructions	60%
playability	70%
graphics	90%
value for money	65%

★★★

Top Ten programs for the Spectrum

1	Lunar Jetman	Ultimate (1)
2	Kong	Ocean (–)
3	Ant Attack	Quicksilva (10)
4	Chequered Flag	Psion/M.House (–)
5	Manic Miner	Bug Byte (9)
6	Jet Pac	Ultimate(8)
7	Atic Attack	Ultimate (–)
8	Flight Simulation	Psion/M.House (–)
9	Zzoom	Imagine (6)
10	Splat	Incentive(–)

Compiled by W H.Smith. Figures in brackets are last week's positions

Top Ten programs for the ZX81

1	Scramble	Quicksilva (1)
2	1K Chess	Sinclair (2)
3	City Patrol	Sinclair (–)
4	Mothership	Sinclair (–)
5	Chess	Sinclair (6)
6	Defender	Quicksilva (9)
7	Asteroids	Quicksilva (7)
8	Fantasy Games	Sinclair (3)
9	Space Raiders	Sinclair (8)
10	Football Manager	Addictive (10)

Compiled by Websters. Figures in brackets are last week's positions

Top Ten programs for the Dragon

1	Ring of Darkness	Wintersoft (5)
2	The King	Microdeal (4)
3	Mined Out	Quicksilva (2)
4	Drone Datatank	Cablesoft (8)
5	Champions	Peaksoft (6)
6	Frogger	Microdeal (1)
7	Empire	Shards (10)
8	Space War	Microdeal (–)
9	Planet Invasion	Microdeal (–)
10	Pettigrew's Diary	Shards (7)

Compiled by Websters. Figures in brackets are last week's positions

Top Ten programs for the VIC-20

1	Wizard and the Princess	Melbourne House (1)
2	Wacky Waiters	Imagine (2)
3	Panic	Bug Byte (3)
4	Arcadia	Imagine (6)
5	Skyhawk	Quicksilva (9)
6	Catcha Snatcha	Imagine (4)
7	Bonzo	Audiogenic (–)
8	Superscreen	Audiogenic (–)
9	Bewitched	Imagine (8)
10	Matrix	Llamasoft (5)

Compiled by Websters. Figures in brackets are last week's positions

BEST SELLERS

Top 30

1	Valhalla	Legend	Spectrum (26)
2	Jetpac	Ultimate	Spectrum (1)
3	Manic Miner	Bug Byte	Spectrum (2)
4	The Hobbit	Melbourne House	Spectrum (20)
5	Kong	Ocean	Spectrum (6)
6	Zzoom	Imagine	Spectrum (4)
7	Lunar Jetman	Ultimate	Spectrum (27)
8	Trans-Am	Ultimate	Spectrum (3)
9	Cookie	Ultimate	Spectrum (7)
10	Killer Gorilla	Program Power	BBC (8)
11	747 Flight Simulator	Doctorsoft	BBC (–)
12	Arcadia	Imagine	VIC-20 (–)
13	Horace and the Spiders	Psion	Spectrum (5)
14	Hall of the Things	Crystal	Spectrum (10)
15	Cuthbert in the Jungle	Microdeal	Dragon (13)
16	Pool	CDS	Spectrum (23)
17	Chuckie Egg	A&F	Spectrum (17)
18	The King	Microdeal	Dragon (24)
19	Bewitched	Imagine	VIC-20 (29)
20	Pssst	Ultimate	Spectrum (15)
21	Frogger	Microdeal	Dragon (21)
22	Penetrator	Melbourne House	Spectrum (22)
23	3D Combat Zone	Artic	Spectrum (16)
24	Harrier Attack	Durell	Spectrum (–)
25	Falcon Patrol	Virgin	CBM 64 (–)
26	Dungeon Master	Crystal	Spectrum (28)
27	Cuthbert Goes Walkabout	Microdeal	Dragon (12)
28	Johnny Reb	Lothlorien	Spectrum (18)
29	Horace Goes Skiing	Psion	Spectrum (19)
30	Aquaplane	Quicksilva	Spectrum (–)

Compiled by PCS Distribution (0254 691211) and sanctioned by the Computer Trade Association. Chart is for retail sales in individual outlets in the UK and Northern Ireland for the fortnight ended November 20

Top Ten programs for the Commodore 64

1	Frogger	Interceptor (9)
2	Purple Turtles	Quicksilva (2)
3	Ring of Power	Quicksilva (5)
4	Quintic Warrior	Quicksilva (3)
5	Attack of the Mutant Camels	Llamasoft (1)
6	Motormania	Supersoft (8)
7	Cosmic Split	PSS (6)
8	Crazy Kong	Ocean (–)
9	Aquaplane	Quicksilva (7)
10	Spriteman	Interceptor (10)

Compiled by Websters. Figures in brackets are last week's positions

Get on the right track for mazes

Our reviewers find their way about five new maze games

Quetzalcoatl 48K Spectrum £5.95

Virgin Games, 61/63 Portobello Road, London W11

This maze game has been given an authentic archaeological flavour. Instead of meeting monsters, you meet various Aztec Gods who may or may not be benevolent

The object of the game is to negotiate your way to the bottom of the temple of Quetzalcoatl, collecting beads to fend off marauding natives.

The temple has four levels, with a maze on each. Mazes are presented as 3D perspective views of long corridors, with doors set in the walls.

There is a true impression of walking through the lonely corridors of a temple, since new frames are drawn with high speed.

I was wandering about on the highest level, when I bumped into the great god Huitzilopochti. His eyes flashed and he gave me a map and compass to find my way down to level two

The map disintegrates every time you look at it, but using it, I was able to locate the blue downward shaft

I was wandering about on level two when I carelessly fell down a black shaft. This broke the compass and to be frank, I didn't have the heart to carry on after this setback.

M.B.

instructions	90%
playability	93%
graphics	93%
value for money	95%

★★★★★

Goblin's Revenge TI-99/4A £7

By Pewterware, from Stainless Software, 10 Alstone Road, Stockport, Cheshire

The object of this game is to find your way through a maze and escape without being caught by a goblin who is in hot pursuit

The northern maze is divided into three sections, and you only see the section that your are currently in.

When you reach an opening of one section which adjoins with an opening of another section, you may pass freely between the two

The old section is cleared from the screen and the new section appears either above or below it. (This obviously depends on whether you are moving up or down, and all happens in a fraction of a second).

As the game is played, you can hear the goblin. The closer he is, the lower the pitch of the sound you hear. You can only see the goblin when he is in the same section as you.

The keyboard is used to move around the maze Keys S and D are used to move left and right, and keys K and L are used to move up and down. The latter two are rather a strange and confusing choice

Graphics, colour and sound are all used very well.

J.J.

instructions	70%
playability	88%
graphics	88%
value for money	90%

★★★★★

Kippy's Nightmare TI-99/4A plus Mini-Memory £7.95

By Data Force, from Tuneless Software, 3 Bridgend, Fauldhouse, West Lothian

This machine code game comes complete with an introduction using the Terminal Emulator II and its own high-speed loader

Documentation is adequate, if a little confusing, consisting as it does of Extended BASIC instructions and a short addendum for the Mini-Memory

The game is confusing, too, throwing you in the deep end The aim is to guide Kippy around a grid, using either the keyboard or the joysticks, in an attempt to cage up to six monsters, using Poofers — (no, no! poofters).

I don't know what they are either They appear to be some kind of time-bomb, counting down from eight to one on screen and then going POOF

When Kippy walks on the grid he lights up dots, across which the monsters cannot pass of their own volition, although they can push one another across The restrictive powers of these dots wane though, so beware

The game ends when Kippy has been caught by the monsters five times.

P.B.

instructions	85%
playability	80%
graphics	90%
value for money	90%

★★★★★

3D Maze/Alien Pursuit Oric £4.99

JPG Electronics, Hilltop House, Gosforth Lane, Dronfield, Sheffield S18 6RD

In the early days of the Oric there was some pretty ropey software knocking about.

This was only to be expected, but the software soon improved, and we all thought the days of the 2K BASIC guess-my-number cassette were gone

Not so fast JPG Electronics has produced a couple of games which should only have been published between the pages of the other magazines.

The presentation of the cassette is nothing special, a black and white insert with a boring line drawing of the 3D Maze.

Now down to the games themselves. Alien Pursuit is a bit of a weird game You control a 'missile base' and have to fight off asterisks by firing off minus signs, slashes and separators.

If you manage to hit one of these "aliens", then the poor soul seems to go through a bout of alpha-numeracy Very odd

3D Maze is marginally better, although nowhere near as good as we have come to expect from commercial Oric software

The screen display was very confused, and even in a two by two maze I didn't know what I was doing or where I was.

P.S.

	55%
instructions	40%
playability	30%
graphics	25%
value for money	

★

Doodle Bug (cartridge) Dragon 32 plus joysticks £19.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot SA13 2PE

This is a Pacman variant which really does have enough new features to give the whole idea interest once more.

You control the Ladybug, who is hungrily eating all in sight before being pursued by the enemy bugs intent on eating her.

Her only defences are revolving turnstiles, which only she can move

These can be used in two ways. to close off a route which would allow the enemy to eat her and to trap an enemy into a closed section of the maze

Besides the usual dots to eat, there are hearts and letters, all of which mean bonus points or lives But you have to survive for a long time to get to such delights.

Control is fairly good, but I did find it difficult to change direction on occasions.

Because you can't eat the enemies, you must use all your stealth and cunning, clever use of the turnstiles being imperative

It is very easy to become hooked on this game, which should appeal to a wide range of ages and skills.

D.C.

instructions	80%
playability	80%
graphics	80%
value for money	70%

★★★★

Fend off the alien fleet

Type in Hamant Patel's game for any model of Oric, and you'll find yourself in the middle of a space battle. Can you shoot down the aliens — or will they get you first?

There are 15 alien spacecraft bent on your destruction in my game for any Oric

They come in two varieties — one can fire, and is worth 20 points. The other is worth 10 points, and doesn't fire.

The game continues until all 15 of the spacecraft have been shot down

Full instructions are given in the game. Your controls are 1 to move left, 2 to move right, and 9 to fire.

How it works

2 turns off capitals and removes capitals from top right hand corner of screen. Turns off key click and cursor

3-70 main loop. Initialise variables. Clear screen. Set up black background, white foreground. Plot score and the number of aliens that have been hit or passed. Plot you and alien spacecraft, making sure you don't go off screen

71-78 check if alien spacecraft hit you

80-108 check variable Y$ for movement

109-160 plot your missiles, check if they go off screen or hit aliens

190-250 movement of your craft, ensures you don't go off screen

290-400 selection of random values for positioning of aliens and check if 15 alien craft have gone by

490-560 redefining characters $, #, %

590-640 random values for side to side movement of one alien ship. Check to see if it goes off

650-760 plot alien missiles, check if they hit your craft

770-870 random values for side to side movement of second alien craft. Check to see if it goes off the screen

955-999 game over, high score, chance to replay

Variables

X,D co-ordinate of your ship
A,B,Z,Q co-ordinate of alien craft
I,S checks for answer y if you want another game
Y$ holds the value of the key presses as you play
C$ person who has high score
X,Y co-ordinate of your missiles
A,P co-ordinate of alien missiles
H high score
S score
CC number of alien craft that have passed or been hit

Hints on conversion

PLOT may be used as PRINT AT, or can be POKEd onto the screen

SCRN (X,Y) returns the ASCII code for position X,Y — used for detecting collisions and hits. PEEK may be used instead

INKEY$ can be used instead of GET

WAIT can be replaced by PAUSE

? means PRINT.

Sound commands ZAP, PING, EXPLODE and MUSIC will have to be replaced by whatever your computer offers.

```
65 A=A-R:IF A<0 THEN A=0:IF A>38 THEN A=38
68 Z=Z-C:IF Z<0 THEN Z=0:GOTO 825
69 IF Z>38 THEN Z=38:GOTO 840
70 S=S+1:O=O+1
71 REM====CHECK IF INVADERS HIT SHIP=
73 IF B>26 THEN PLOT A,B-1," ":MUSIC1,3,12,9:GOTO 310
74 IF SCRN(A,B)=37 THEN EXPLODE:GOTO960
75 IF SCRN(A,B-1)=37 THEN EXPLODE:GOTO960
76 IF Q<25 THEN PLOT Z,Q-1," ":MUSIC 1,5,12,9:GOTO 400

77 IF SCRN(Z,Q)=37 THEN EXPLODE:GOTO 960
78 IF SCRN(Z,Q+1)=37 THEN EXPLODE:GOTO960
80 Y$=KEY$
90 IF Y$="9" THEN 110
91 IF Y$="2" OR Y$="1" THEN 200
105 PLOT Z,Q,"$"
108 GOTO 35
```

```
1 REM=======ALIEN 2000=======
3 PRINTCHR$(17);CHR$(28);CHR$(6)
4 REM======PLOTTING INVADERS====
5 PLOT A,B,"#":P=INT(RND(1)*20)+1
10 CLS:B=0:CC=0
11 GOSUB 500:GOSUB 880
12 CLS
13 PAPER 0:INK 7
15 X=19:D=26:Y=26
16 PLOT X,D,"%"
20 A=INT(RND(1)*38):B=0
25 Z=INT (RND(1)*38):Q=0
26 P=INT(RND(1)*20)+1
27 GOSUB 770
30 PLOT X,D,"%":IF Q>26 THEN 24
35 GOSUB 600
50 PLOT A,B,"#":IF B=P THEN 700:MUSIC 1,3,12,5
GOTO 999

51 IF SCRN(A,B)=37 THEN EXPLODE:PLOT A,B," ":GOTO 999
52 PLOT Z,Q,"$"
53 PLOT 1,0,"SCORE";S#=STR$(S):PLOT 7,0,STR$(S):PLOT 0,
0,4
54 CC#=STR$(CC):PLOT 36,0,STR$(CC):PLOT 28,0," ALIENS "
:PLOT 28,0,1
55 PLOT 36,0,2
56 WAIT 5
60 PLOTA,B," ":PLOT Z,Q," ":MUSIC 1,1,4 ,9
```

ORIC PROGRAM

```
109 REM=====PLOTTING YOUR MISSILES=====
110 ZAP
111 PLOT X,Y-1,"!":PLOTA,B,"@":PLOT Z,Q,"#"
120 PLOTX,Y-1," ":MUSIC 1,3,11,9
130 Y=Y-1
135 REM===CHECKING IF YOU HIT INVADER===
140 IF SCRN(X,Y-1)=35 THEN PING:PLOTA,B," ":S=S+20:GOTO
 310
145 IF SCRN(X,Y-1)=36 THEN PING   :PLOT Z,Q," ":S=S+10:
GOTO 400
150 IF Y=1 THEN Y=26:GOTO50
160 GOTO 111
190 REM===MOVEMENT OF SHIP=======
200 PLOT X,D," "
205 X=X+(Y$="1")-(Y$="2")
206 IF X>38 THEN X=38
207 IF X<0 THEN X=0
210 PLOT X,D,"%"
220 GOTO 50
230 IF X 0  THEN X=0
235 PLOT X+1,D," "
240 PLOT X,D,"%"
250 GOTO 50
290 REM===POSITIONING OF SHIP=====
300 A=INT(RND(1)*38):B=0:CC=CC+1:IF CC=15 THEN 955 ELSE
 30
400 Z=INT(RND(1 *38) Q=0:CC=CC+1:IF CC=15 THEN 955 ELSE
 GOTO 825
490 REM==REDEFINING CHARACTERS====
500 FOR J=46360 TO 46380
510 READ D
515 POKE J,D
516 NEXT J
520 DATA 0,8,20,42,20,8,42,42
530 DATA 8,28,54,42,54,28,42,42
540 DATA 12,12,12,30,12,30,45,45
555 RESTORE
560 RETURN
590 REM===POSITIONING OF INVADER====
600 T=INT(RND(1)*3)
610 A=A+T
615 R=INT(RND(1)*3)
620 IF A<0 THEN A=0
630 IF A>38 THEN A=38
640 RETURN
650 REM==PLOTTING INVADER MISSILES==
700 PLOT A,B+1," ":PLOT X,D,"%"
705 PLOT Z,Q,"#":MUSIC 1,3,9,12
720 PLOT A,B+1," "
730 B=B+1
735 IF B>25 THEN 51
825 W=INT(RND(1)*3)
830 Z=Z+W
840 C=INT(RND(1)*3)
850 IF Z<0 THEN Z=0
860 IF Z>38 THEN Z=38
870 GOTO 50
880 REM======INSTRUCTIONS=====
900 CLS
901 MUSIC 1,1,1,7
905 PAPER7:INK0
910 PLOT 12,08,"INSTRUCTIONS":PLOT 7,08,22:PLOT 29,08,2
3
920 PLOT 7,11,"Use key 1 to move left"
930 PLOT 7,13,"Use key 2 to move right"
940 PLOT 7,15,"Use key 9 to fire"
941 WAIT 250:CLS
942 PLOT 6,8,"The aim is to destroy as"
943 PLOT 6,9,"many invaders as possible"
944 PLOT 10,13,"#-  ---10 POINTS"
945 PLOT 10,16,"@-- ---20 POINTS"
947 WAIT 250
950 RETURN
955 REM=====SCORE/HIGH SCORE   ======
960 GOTO 969
962 CLS
965 PRINTCHR$(4)
966 PRINTSPC(13);CHR$(27);"NScore:";S;CHR$(4)~GOTO 986
969 CLS
970 PLOT 7,11,"Well done'You have got"
971 PLOT 7,12,"todays high score";H=S
972 INPUT"Type in your name";C$:CL$:GOTO985
980 CLS:PRINT:PRINT:PRINTSPC(13)"SCORE:";S:GOTO999
985 PRINT:PRINT "HIGH SCORE";H;"  BY    ";C$
986 PLOT 04,07,"Do you want another go?"
987 PLOT 07,09,"Type in Y or N"
988 GET L$
989 IF L$="y"THEN 10
990 IF L$="n"THEN 999
991 GOTO 987
999 PRINTCHR$(17);CHR$(20);CHR$(6)
```


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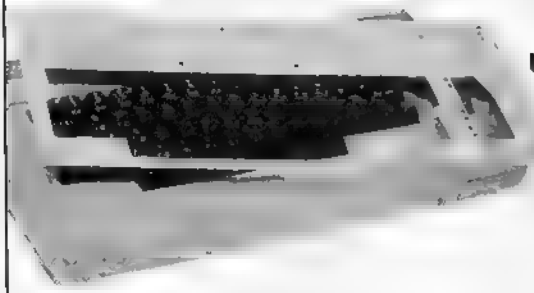

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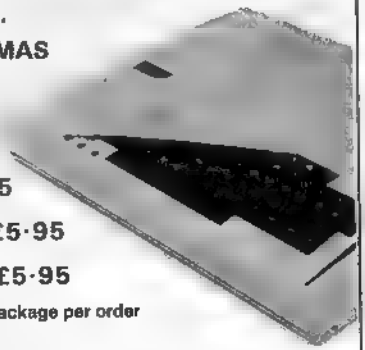

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Part-time pair grow with Sinclair

Despite making a name for itself in Sinclair software, Macronics is still a part-time business. Ken Macdonald, the man who put the Mac into Macronics, tells Candice Goodwin why he's holding on to his full-time job

Over the last year, we've seen home computer software change from being a backroom business into big business

People who only a few months ago were sending off mail-order programs in the evening, while holding down other jobs during the day, are now running their software companies full-time and moving into their own offices, with their company logo on the door.

One exception to this rule is Macronics, a company that has been responsible for such innovative programs for the Sinclair micros as City Patrol/Sabotage for the ZX81, and Alien Insects and Ant Attack for the Spectrum.

Ring Macronics partners Ken Macdonald and Ron Bissell during the day and you'll find them at work. Friends for many years, Ken and Ron both have full-time jobs developing computer projects for a large regional health authority.

Ken is a senior systems designer, and Ron, described by Ken as "the whizz kid", is an electronics expert.

When so many others are seeking their full-time fortune in software, the obvious question is why Ken and Ron haven't followed suit.

Ken's answer is: "I've got a stable and interesting job in an area which, because of staff cuts, has become more important to the health service rather than than less. And to offset the disadvantages of working for a large organisation, such as not being able to take decisions by yourself, Ron and I have got the part-time software business

"If we did start to work for ourselves, it would be in business rather than games software. Games are selling well now, but in the long term — I'm not so sure. I foresee some degree of saturation — though maybe not for some years yet."

Yet according to Ken, Macronics narrowly missed achieving Sinclair-style success back in 1980. "Just before the first ZX80 with the 4K ROM came out, we had a design on paper for a home computer with push-button keyboard with multifunction keys. But of course, when the ZX80 arrived we decided to shelve the idea."

Instead, Ken and Ron decided to aim for the gap in the market for ZX80 software. They pooled their resources to buy a ZX80, which at that time cost the princely sum of £99.95, in order to "find out what it was all about." And the result of their investigations was the first animated graphics for the ZX80.

Ken explained: "The ZX80's 4K ROM didn't have an animated screen facility. But Ron Bissell found a way of using interrupts to get it to carry out its processing while the last two lines on the screen were being refreshed

"When they brought out the 8K ROM for the ZX80, it included better facilities for file display. But I don't suppose we can claim the credit for that."

At this time, Macronics' programs were still sold in the form of listings. It wasn't until the ZX81 came out that cassette-based software really began to take off. Ken and Ron did market a few ZX81 cassettes, but most of their energies went into developing a disk drive interface to overcome the ZX81's tape loading problems.

Though the interface's £100 price tag made it too pricey for the average ZX81 owner, they sold 550 of them. And when the Spectrum was imminent, they decided to make an interface for that, too. They now have a working prototype, which was on display at the PCW Show, and hope to be producing them in volume by Christmas.

Ken Macdonald — foresees games reaching saturation point

The drive's development was, it seems, fairly typical of the way Ken and Ron work together. Ken said: "Ron's very creative — he always wants to tackle a challenge. But he doesn't like tidying up — he loses interest once he's cracked the basic problem. On the other hand, I'm better at the management side. I had to keep on at him to make sure he finished off the Spectrum interface."

Neither of them have much time for games programming these days. In any case, Ken feels that, in a marketplace full of teenage programmers, they're probably too old — "The games market needs young people, because they know what the kids will buy. My kids buy games I wouldn't look twice at."

Ant Attack and Alien Insects were written by Nigel Stuart, a 15-year-old programmer they met at a Manchester computer exhibition.

Any time now, Macronics will be releasing a new batch of games ready for Christmas. Blind Mice is a cat-and-mouse game — plus a dog — and the chase takes you through eight screens, starting at the front of the house and moving on to the staircase and up and down the bannisters. It will, Ken promises, have colourful graphics and good sound.

Orb of Orion will be Macronics' first adventure game. They're also working on a 100K arcade adventure, to be sold on cassette, but aimed at the lucky people who have managed to get hold of Microdrives.

And "for those who've zapped everything in sight" there's Tunnel Tester, which should keep even hardened arcade addicts quiet for the Christmas holidays at least. This alien-zapping game, says Ken, is not for the novice "If you haven't got to grips with Space Invaders yet, forget it."

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Each of our 40 winners will get two twin-packs, worth £9.99 each, plus two big full colour posters.

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Study the two cartoons below — there are several differences between the two.

Circle the differences on the right hand cartoon in ballpoint pen and then complete the coupon, not forgetting to name your computer — Spectrum, Dragon 32, VIC-20 or Commodore 64. This is so that we know which prizes to send.

Then cut around the broken lines, seal the drawing with coupon attached in an envelope and write clearly on the back of the envelope the number of differences you found.

Post your entry to Phoenix Software Competition, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Entries close at first post on Friday December 23.

The HCW offices move on December 20 to 1 Golden Square, London W1R 3AB. Although post will be forwarded, if your entry is likely to arrive on or after the date it may be wise to use the new address to avoid missing the closing date.

The winners will be the first 40 correct entries opened at noon on the closing day, regardless of computer.

Copies of the coupon will not be accepted.

The solution and the names of the winners will be published in the news columns of Home Computing Weekly and the prizes will arrive from Phoenix Software within 28 days of the publication of that issue.

Important: please remember to follow the How to Enter section carefully. Any entries which are not complete — including the number of differences on the back of the envelope — have to be discarded.

In the unlikely event of stocks of prizes for the named computers running out, prizewinners will receive another of equal value to sell or exchange.

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Entries will not be accepted from employees of Argus Specialist Publications, Phoenix Software and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

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Back on the tee with another of these real game simulations.

This version credits you with a near winning situation half way through a tournament on the Nevada course. Pitted against some of the best names, you take over at the tenth hole

The program starts with a weather report and then asks for your surname to include on the leader board Your current position is given together with your opponents' scores

A menu provides you with the options, an overhead view, a tee view a club selection, the standings or a review of the scores.

The hi-res screens are nicely drawn and painted showing the green and a bit of the surrounding country The only problem is that there is no update of your current position of the ball

Though somewhat expensive, it's a nice program which, in spite of the fact that it's written in BASIC, responds very quickly and has some effective sound routines **M.P**

instructions	90%
playability	95%
graphics	60%
value for money	60%

★ ★ ★

'Owzat
32K BBC £7.95

Virgin Games, 61/63 Portobello Road, London W11

'Owzat is a graphical simulation of a test match between England and Australia

The program loads in two parts. Part one is used to set up the teams — you can either use the preprogrammed teams or change them

Part two is the main section, and is RUN for each innings

The bowling can be auto or manual, as can be the batting If you put both on auto you can just sit back and watch or doze off!

In manual batting mode, you can move the fielders around to set up different tactical styles of play

My main disappointment was in the lack of sound effects. Not one sound came out of the computer With all the capabilities of the BBC sound, this seems very strange, and Virgin should do something about it

But this failing apart, the game appealed to me and gives a change of scene from outer space to the Oval **J.H.**

instructions	90%
playability	80%
graphics	45%
value for money	80%

★ ★ ★ ★

Pool
48K Spectrum
£6.95

Abrasco, The Grange Barn, Pikes End, Eastcote, Middlesex

This is not the game with which I misspent my youth, but it's pretty close, and a good game it is too

The game caters for either two players or you can set up a league of up to eight

Full instructions are given on screen and are easy to follow

If you select a league match, this can be saved to tape for completion at a later date

The screen display shows the table, the names of the players and their scores plus a few pithy comments on your play

Positioning of the cue is via the cursors and when all is set, a strength of shot is displayed

It's a pity that the graphics for the balls cannot be better — they do let down the game a bit — but they don't detract from the enjoyment of the game as a whole **N.B.**

instructions	95%
playability	90%
graphics	85%
value for money	90%

★ ★ ★ ★ ★

Rabbit Shoot
Spectrum
£4.95

Phipps Associates, 172 Kingston Road, Ewell, Surrey KT19 0SD

I was expecting great things after I read the insert of Rabbit Shoot "Machine Coded for the best speed and graphics presentation" I was bitterly disappointed.

From what I could gather, the only thing which was in code was the sound effects, which were nothing special anyway

If I am wrong and it is all in machine code then it is the most inefficient coding I have seen for a long, long time.

The game is split into two parts. Firstly the instructions on one side of the tape, and the game on the other side

You are in a field, and at one end are a few rabbits

You have a shotgun (which seems to be pointing in the wrong direction), with which you must shoot these poor rabbits Could there be something slightly immoral buried deep inside this game?

I had to fire a few shots before I found out where my blast was going. All you can see is the 'smoke' from your gun, and a quick flash where the shot lands

The quality of the graphics leaves a lot to be desired The speed is pretty slow for a game written in machine code, and the game itself is altogether quite boring **P.S.**

instructions	80%
playability	30%
graphics	35%
value for money	40%

★ ★

Abrasco Golf
Spectrum
£5.95

Abrasco Software, The Grange Barn, Pikes End, Eastcote, Middlesex

Abrasco Golf is a two player game I would have preferred to see a simple one player option as, you may well know, it is not always possible to get willing volunteers to play your computer games with you

The program is in two parts, first the instructions and then the program proper There are 10 pages of instructions which tell you, in far too much detail, how to play the game

The screen display is not too impressive, and could have been mistaken for a ZX81 game on a black and white set The tee is shown as a capital T (corny), and practically everything else as graphic blocks

You are asked if you want an iron or a wood If you choose an iron you then have to choose between 1 and 9 If your choice is wood, you can have either 1 or 3

Direction is chosen by compass points, and distance also has to be entered

On the whole Golf is not fantastic

How many more slow, BASIC games can the market take? **P.S.**

instructions	90%
playability	70%
graphics	30%
value for money	20%

★ ★

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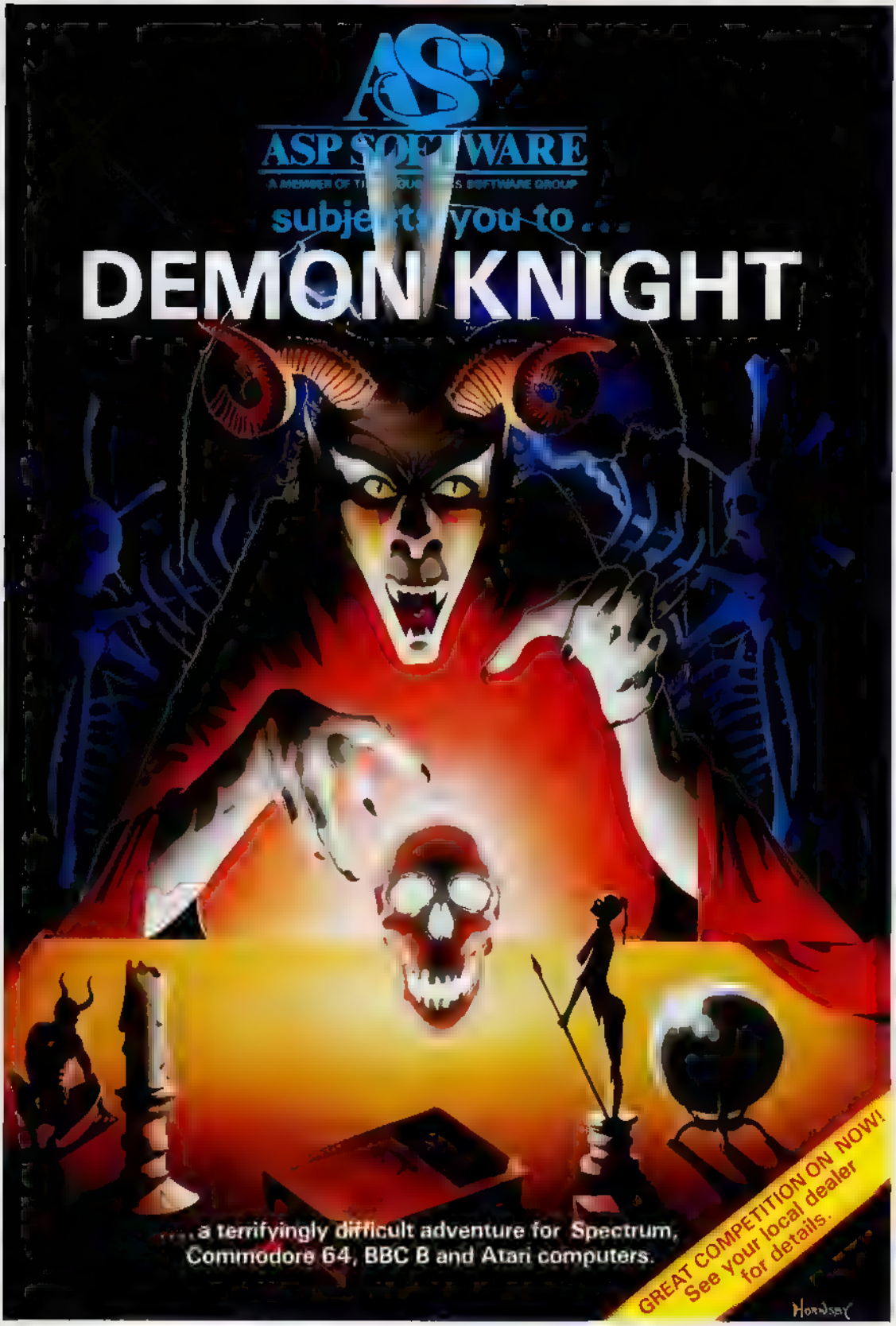
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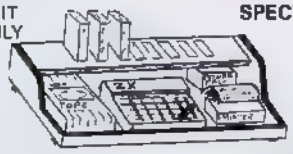

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